

The Mining And Metallurgical Journal

Vol. XIX. No. 2

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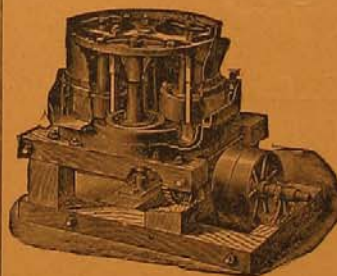
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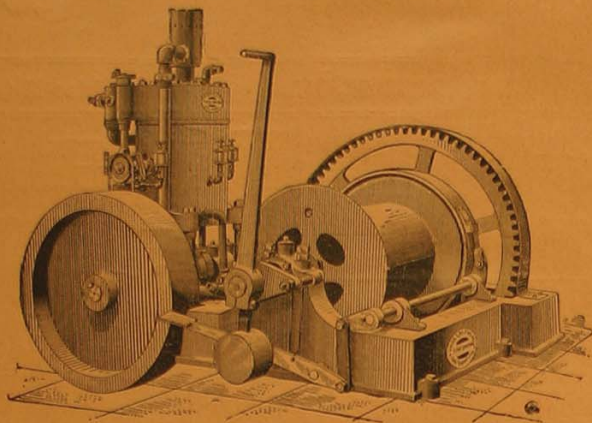
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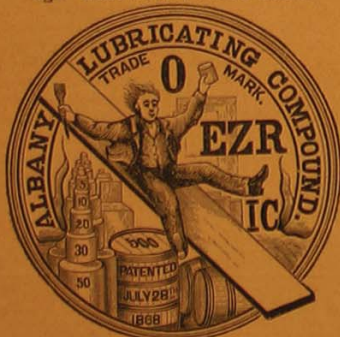
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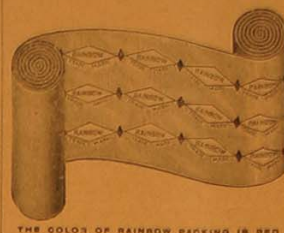
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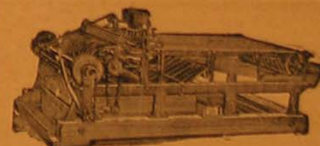
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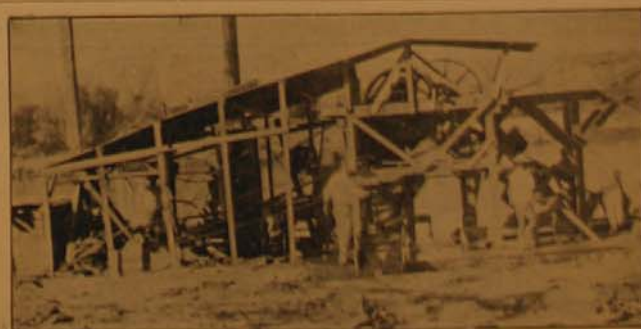
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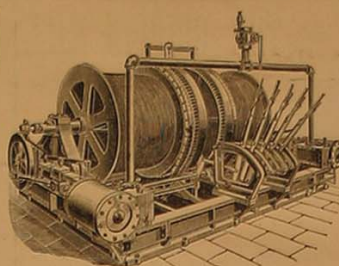
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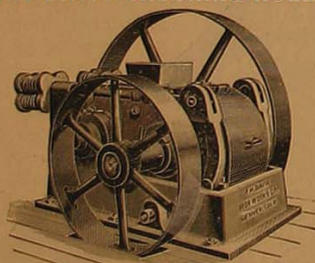
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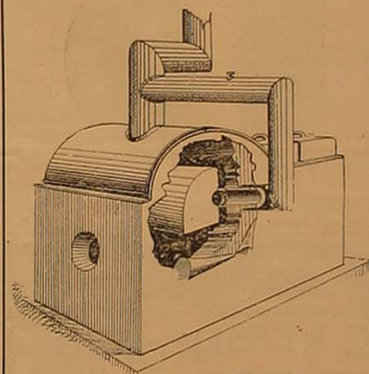
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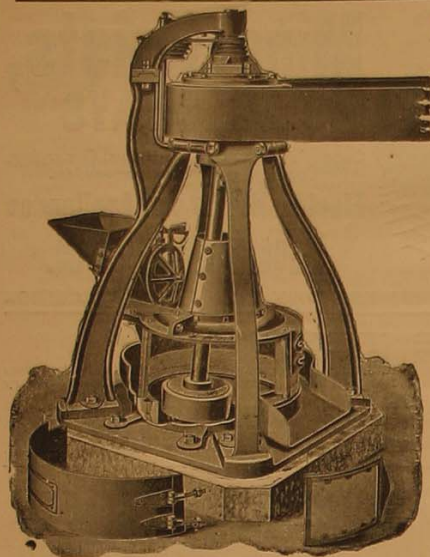
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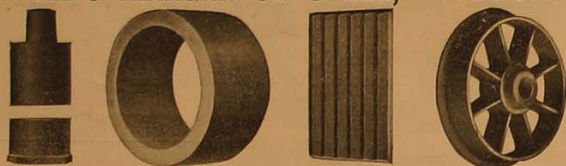
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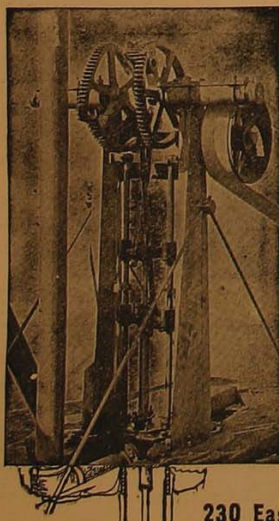
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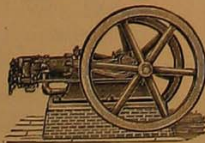
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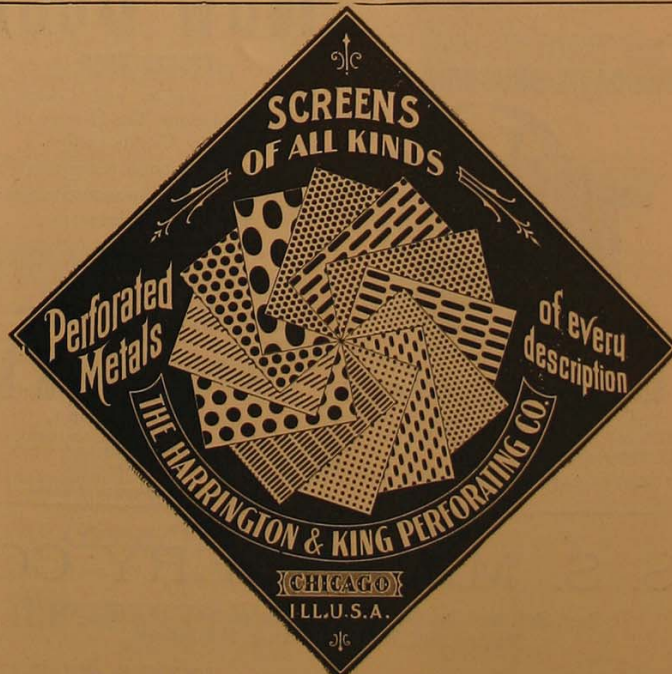
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We are happily in possession of abundant evidence that the efforts of the JOURNAL are appreciated; this evidence is in the enlargement of its circulation and increase of advertising patronage. The proprietor and editor takes a profound interest in the great mining industries of the nation, and is a source of personal happiness that he is in a position to aid their development. He selected Los Angeles and San Francisco as places in which to prosecute his work, because the former is a new and rapidly-growing city, and is situated so as to command support from the mining interests, and from it there are excellent conveniences for distributing knowledge on mining subjects, and for stimulating mining interests proximate to it, contribute in no small degree to its prosperity and growth, and the latter, (San Francisco), because it is an old and well known mining section, with numerous resources behind it.

Knowing that mineral productions are among the most important in domestic consumption, and in both domestic and foreign commerce, the JOURNAL will emphatically devote itself to their increase, and in doing this it will perform its part in making Los Angeles and San Francisco the commercial and industrial centers on the western coast of the republic.

The *Mining and Scientific Press*, of 2nd April, says "Two mining cases last month strikingly illustrate the necessity for change in our mining laws, so that well-meaning and intelligent judges can render at least approximately correct decisions."

If the writer of the above had said that a change was necessary in our present manner of administering justice in mining disputes, by having such cases arbitrated upon by a State Commissioner of Mines, assisted by two experienced mining engineers representing each side of the case, at the ground in question, and with the evidence and cause of trouble before them, in place of having it tried in courts of law before lawyers who do not understand mineral conditions, the case would be more correctly stated. The chief evil in our mining laws at present lies in our wrong manner of dealing out justice by lawyers who have not seen the ground in question, and whose business it is to litigate and carry on the fight. The doctors in the case differ, and the patient, which is the mining industry, either dies, or has to pay costly legal expenses as a remedy, for what is too often not a just decision on account of the conditions of the case having been falsified by a clever lawyer, or with the aid of over-zealous witnesses.

"The suit was E. R. Morse against the Montana Ore Purchasing Co., which was tried in the United States Court. Judge Knowles, who patiently gave attention to the case, plainly stated his inability to feel satisfied with his own decision. The fact that about twenty mining experts testified to contradictory statements, probably increased the judge's perplexity."

Had the judge been a mining man of experience, taking the evidence on the ground, in presence of the witnesses, such a condition would not be possible. The evil does not lie in our mining laws, but in our wrong manner of dealing out justice between miners on adjoining claims. The fact is, that in the east, where the square or large location is in force, the owners will have disputes as to the boundaries of claims, and to ore bodies dipping under the boundaries, where they are divided by vertical lines, just as much as under the Federal mining law where the just boundary for the miner is recognized, which is the extra lateral right to follow the dip of the vein or deposit. The evil exists then in our wrong manner of settling mining disputes by lawyers in courts of law, instead of by mining men by arbitration on the ground.

EXCITEMENT AND ITS EFFECTS.

The influence of storm upon the atmosphere is like that of excitement upon the human mind. Americans are not the most excitable people in the world, but being of mixed Celtic and Teutonic lineage, they are less excitable than the southern European, and more so than the northmen. Unusual excitement is a disturber of business. We have experienced this in connection with the Spanish imbroglio. It has disturbed the tradesman, the farmer, and others engaged in commercial and industrial pursuits. The miners who delve under ground are perhaps less disconcerted than any of the industrial classes. Business is more active only with those engaged in manufacturing war supplies. Speculation is depressed, for no one is able to calculate what influence war will have upon future values.

There were before Congress sharp issues which promised spirited and protracted discussion. The annexation of Hawaii has given way to the consideration of war measures and talk upon the money question has ceased for the time, and it will probably not be resumed during the present session, nor during the life of the present congress. The silver question and the money system seem destined to remain as they are until a new Congress is chosen and convenes for work.

The merits of the present money system have been discussed upon theoretical grounds, but the delay which seems inevitable may demonstrate its evil or valuable features, its practicability. In the mean time, affairs will jog along uninterrupted by prospect of monetary changes. The greenbacks received their birth from the war of the rebellion. War creates a demand for a larger money volume on account of the extraordinary expenditures of the government, and a war with Spain of considerable magnitude might have the effect to restore government notes to something like their former volume. Events may have the effect to radically revolutionize ideas on the money question. An irresistible demand for more money might result in forcing the adoption of free silver coinage and demonstrate the inadequacy of the single gold standard to supply extraordinary wants.

Meantime, let our miners delve on, whether in the production of gold, silver, lead or copper. There is no cause to fear that their labors will receive less reward in future than in the past, except in the lessening of the outputs. War may temporarily reduce demand for some of the minerals, but for others it will increase it. So far as prices are concerned, we do not look for appreciable reduction. If war takes place, the people will know how to deal with the situation, and it will be the same in regard to peace. It is uncertainty that disturbs and tantalizes. It has had this effect for the last two months.

THE RUSH UNABATED.

Though, in addition to the unusual hardships and exposures, and sickness and death, there are failures and discouragements which cause thousands to return in disgust, yet the rush to the Klondike and the Yukon valleys continues unabated. Ships from San Francisco and Seattle are loaded with gold-seekers, and, as on return trips they have good passenger lists, it is quite certain that the transportation companies will make more money than any class engaged in mining in that arctic region.

Perhaps the best evidence that gold in quantity exists in that region is that capital is being invested in railroad construction over the mountains and in boats on the rivers, which are only navigable for a few months of the year. As it must be that the placer gold will be shortly exhausted by the myriads engaged in gathering it, there must have been discovered a considerable quartz-bearing gold, and which will require years to exhaust. The large investments required to give the country sufficient rail and steamboat transportation would not be made to supply what cannot be more than a temporary demand. There is little else than gold produced in the country to justify the permanent improvements that seem to be in contemplation.

The rush to Alaska will to an extent lessen the number of idlers in the country, and make room for the employment of those remaining at home. It will also make a market for no inconsiderable quantity of the sur-

plus products of the country, and lead to better prices, for those who go there will be consumers without being producers, and there will be much waste in getting supplies to them. Temporarily, at least, the rush thither will make better times in some localities, whatever the output of gold may be.

We do not look, however, for so much gold production as the optimists have been led to expect from the effusions of florid imaginations which have been published; but we are of the opinion that collapse of the furor, though it will be gradual, will not be distant. The momentum acquired will not immediately expend its force. The Klondike mining fever has reached an unusually high temperature, and it will take more time to cool it off than is common. The reason why the fever has become more than ordinarily severe is the fact that gold has been made more important and valuable by its having had cast upon it larger functions in monetary and commercial affairs than ever before. In popular estimation, it has become the ideal of all that is good in the material world. The passion for it however will die out, on the principle that a craze of any kind has its day.

The United States being a new country, rushing has been the normal characteristic of the people, rushing to gain wealth speedily, while a few have succeeded, the many have failed, and though experience has shown that it is better to be content with gradual and moderate gains, yet the wish has continued, and will still continue, until all fields have been explored and exploited. That time has nearly arrived in this country, and in fact in the entire world. There is very little to be explored outside the arctic and antarctic regions, and they have been tested, so far as productions of the soil is concerned, to the ultimate lines of climatic prohibition.

We opine that long after gold mining in Alaska has ceased to attract enterprise and capital, mining for the precious metals in temperate regions will be flourishing and profitable. The time must be near when excitements will be superseded by steady and persistent efforts in fields which yield unerring results, and such as should be satisfactory to people of good sense and rational ambition. While we do not expect to arrest the rush to Alaska, we think it well that people should follow the dictates of unimpassioned judgment rather than an impulse created by the exaggerated statements of an excited imagination.

WAR AND ECONOMIC QUESTIONS.

Should there be war, it will not remove the issues on economic subjects; on the contrary, it will tend to make them more conspicuous, and the contest over them more earnest and energetic. The government will need increased revenues, and, consequently, new measures of taxation will be suggested, both external and internal. Increasing duties upon commodities will not tend to increase revenue, as it will restrict importation. It is probable that tariff changes will be by transferring from the free to the dutiable schedules. From this source some additional revenue will be realized, but it will not be great, as in general the value of commodities in the free list is inconsiderable.

There will necessarily be bond issues if the war is protracted, and no doubt the effort will be made to change the law, so as to require them to be paid in gold coin only, instead of generally in coin, as the law now is, and as has been the practice heretofore.

There will have to be a larger volume of the circulating medium, and the question will be raised whether it shall be done by further issue of greenbacks, or an enlargement of the national bank circulation. As silver coinage is a convenient way to increase the money volume, a return to its coinage will no doubt be insisted on. Thus differences on economic subjects are likely to be more earnestly pressed than if the country had remained in profound peace.

The first effect of war is to depress business, and it will be noticeable more especially in foreign trade, as Spain has something of a navy, and she may issue letters of marque and reprisal. Domestic commerce will however speedily recover its former volume; not only that but the volume will be increased, by reason of the government being a large purchaser of war materials and army and navy supplies, and as this will increase demand, prices will be higher and business will resume activity. By reason of this also more money will be required, partly because the volume of traffic will be larger, and circulation cannot be as active, as large sums will be held to pay troops and marines and carry on the transportation of supplies, of ordnance stores, and of food and clothing.

The war may be somewhat eventful, but it does not seem that it can be protracted. During war economic problems are dealt with on different theories than in peace time. The solution of them will be watched with an interest second only to the events of the conflict.

It is probably inevitable that internal taxes will be considerably extended and rates raised on such articles as are already taxed. The young people of the country will have an experience the same as that of the generation on the stage of action a third of a century ago.

CO-OPERATION RECOMMENDED.

The chairmen of the Democratic, Populist and Silver Republican parties have generally issued an address to the American people, in which they concur in recommending co-operative action by the three parties in the impending election for representatives in Congress and members of the legislatures in states where senators will have to be elected to succeed those whose terms expire with the present Congress.

The chief issue which these addresses make is in regard to the money policy. It is needless perhaps to say that they all agree on the subject of silver coinage and in hostility to trusts and monopolies, which are alleged to be formed and operated by the advocates of the gold standard. That on this line the battle will be fought there can be no doubt. The position of the national administration, as represented by Secretary Gage, forces the issue and it is eagerly accepted by the friends of silver coinage. The contest promises to be one of unusual energy for what, in common parlance, is denominated an "off year."

The proposition of the three parties named is not a fusion but a coalition; thence, there is not likely to be the fullest development of strength, for, parcelling out the nominations for office there will inevitably be more or less dissatisfaction. The friends of the gold standard will go into the contest with compactness of organization. It is certain, judging from their action in 1896, that the democrats will not be harmonious, and that a considerable percentage will go over to the repub-

lican party in support of the single standard. The issue on the money question will inevitably lead to a re-organization of political parties. What the result will be in the congressional elections can only be conjectured at the present time. It is desirable that the question should be settled, that there may be certainty in our monetary systems.

The Pelton Water Wheel Company report great activity both in their San Francisco and New York Works, orders for 492 wheels having been filled during the past year, of capacities varying from 10 up to 200 horse power, an increase in number of nearly 100 over that of the previous year. While the majority of these wheels have been sent to the mining districts of the Great West, large numbers have gone to Mexico, China, Japan, Australia, and many other foreign countries, to be used for mining, electrical and various other purposes.

The extraordinary success that has attended the introduction of the Pelton wheel in all parts of the world, indicates that it is more fully meeting the varied requirements of such service than anything ever before introduced, as well as the fact that there is a better appreciation of the value of water powers for all industrial enterprises. Any information relating to this system can be obtained by addressing the Pelton Water Wheel Company, 121-123 Main Street, San Francisco, Cal.

GEORGETOWN, COLORADO,
January 10th, 1898.

WEBER GAS AND GASOLINE ENGINE CO.,
Kansas City, Mo.:

GENTLEMEN—The 10 H. P. Gasoline Hoist bought from your Denver agency has been set up over a shaft underground, 1100 feet from the mouth of the tunnel. The exhaust is carried outside by means of a 4-inch galvanized iron pipe. We began hoisting from a depth of 60 feet, and are now down 175 feet. We only hoist from 25 to 40 buckets per day, as we are sinking, and consume about 3 gallons of gasoline. The mine is situated at an elevation of 10,000 feet above sea level. We are well pleased with the machine and cheerfully recommend it.

Yours truly,
FRANK A. MAXWELL,
U. S. Deputy Mineral Surveyor.

The Lehigh University.

The Register of Lehigh University, at South Bethlehem, Pa., recently issued, shows an attendance of 363 students, divided among courses as follows: Mechanical Engineering 106, Civil Engineering 84, Electrical Engineering 66, Mining Engineering 46, Analytical Chemistry 28, Architecture 10, Literary and Classical Courses 23. The teaching force comprises 42 instructors of all grades, which is in the proportion of one instructor to less than nine students. A careful study of the Register shows that while the University is largely devoted to technical branches, the culture studies, such as English literature, history, modern languages, political economy, and philosophy form quite a large part of the curriculum. Abundant opportunity for practical work is afforded in the physical, electrical and chemical laboratories, and in the summer schools in Civil and Mechanical Engineering. The literary and classical courses are also well equipped.

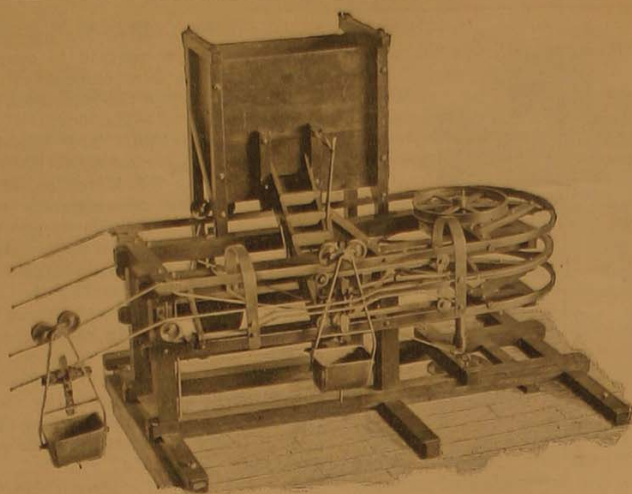


FIG. 1—UPPER, OR LOADING TERMINAL.

WIRE ROPE TRAMWAYS.

The value of Wire Rope Tramways for the transporting of ores from mines to mills, and as feeders to railways for transporting light merchandise, coal, etc., etc., and many other purposes: across mountains, rivers and flat marshy lands or down steep gradients, where rail or wagon roads are impracticable; running by gravity, where there is sufficient difference in level between terminals, or by applied power where there is not; is well understood and cannot be overestimated. The immediate vicinity of a mine does not usually offer the best location for a mill, as some of the natural requirements may be lacking, such as supply of water, cheap fuel, location and accessibility. In such cases the mills are necessarily often located at a distance usually over a rugged contour of surface, and in the development of the mines Wire Rope Tramways deserve the careful consideration of the mining engineer.

The distance tramways may be operated varies from a few hundred feet to several miles.

The Finlayson Patent Automatic Wire Rope Tramways, three views of which we show in connection with this article, presents a cheap and particularly favorable method of transporting ores or other materials, carrying loads up to 1,000 pounds per bucket up or down steep gradients, at a very small cost per ton, frequently making the difference between a paying and a non-paying mine.

The principle of construction is based on the double rope system, in which separate stationary cables are used for the supporting tracks and a lighter hauling or traction rope connecting and moving the buckets, thus doing away with the heavy vibration, as in tramways where the single rope performs the dual function of supporting and hauling the load. The regular ore buckets as used on this system have a capacity of four and a half cubic feet, and are carried on a two-wheel truck moving on the stationary or track rope. At the terminals an iron track is substituted for the standing or track rope.

The distinctive patented features of this system are the automatic terminals, detachable buckets, patent automatic starter for gradually starting each bucket which has been stopped for unloading or loading purposes, and an automatic dumping device.

A carriage located at each terminal (or at any intermediate point along the line) for automatically and gradually starting each

bucket and truck, does away with the jar on the moving rope, which, connecting suddenly to a loaded bucket at rest, causes great wear to clip and rope; also saving the expense of labor and doing away with the arduous and ever watchful duty of the man who watches for the fastening joint on the traction rope, and who gives the final *shove*, to give the bucket a part of the required momentum of the traction rope.

Fig. 1 shows the loading terminal at which the bucket after being filled from the ore chute, is at the proper time automatically and gradually started and becomes attached to a clip which is fast to the hauling rope. The following bucket having previously been detached from the clip is moved along and into position to be loaded and taken along by the next clip.

From cut it can be seen that the loaded bucket has just started out of terminal going on its way down the line. Bucket which is at terminal is loaded and ready to go down the line, as next incoming bucket, after passing around terminal wheel, would be released from the running rope at yoke.

Fig. 2, Lower Terminal, shows the bucket in the act of being dumped. This action is performed by the bucket which is now on the back side of timber work and is going on its way to upper terminal. This bucket which is being dumped, will right itself, will be picked up by the clip which is now attached to the incoming bucket; as this incoming bucket reaches the yoke, shown in the timber work, this bucket will be released from the

clip on the running rope; clip will pass on, pick up the unloaded bucket, and unloaded bucket will start around the end of terminal on its way up the line, and in passing on back side of the timber work, will dump the incoming loaded bucket. As unloaded bucket is being picked up by the clip on traction rope, the loaded bucket is being drawn into place for dumping. The automatic dumping device at this station, turns the bucket upside down returning it to its original position while it is waiting to be taken up by the following clip, and also allows sufficient time for it to be loaded with up freight, such as coal, lumber, powder, groceries, or any other supplies.

Fig. 3, Complete Line, showing construction of the derricks and at the same time showing how ropes are carried at these supports.

The buckets being detachable allows them to run to any point, where track is provided. This is done by switching in another bucket to take the place of the one switched out and run to point on hanging rail to receive special load.

Derricks, or supports, for stationary rope, are usually from 100 to 300 feet apart. Long spans can be made by using a heavier standing rope over such spans.

The standing rope is usually $\frac{3}{8}$ to 1 inch in diameter on unloaded side, and 1 inch to $1\frac{1}{8}$ inches in diameter on loaded side.

Traction rope is usually $\frac{3}{4}$ inches in diameter.

These, and other valuable features, go to make a tramway system where operating expenses are at a minimum, and anyone contemplating the erection of a tramway cannot afford to overlook this system.

In this system the running rope is always carried on sheaves at just the proper position from the standing rope. By so carrying the traction rope, the great strain on the grip parts at bucket is relieved, and there is no possibility of the clip on the rope tearing itself out of the grips on bucket frames.

This system has been giving very severe tests and is proving itself all the manufacturers claim it to be.

The Colorado Iron Works Co., of Denver, Colo., are the sole manufacturers and sellers of this device.

The Arkansas Valley Smelting Company, located at Leadville, Colorado, has placed an order with the Colorado Iron Works Company of Denver, Colorado, for one carload of water jackets.

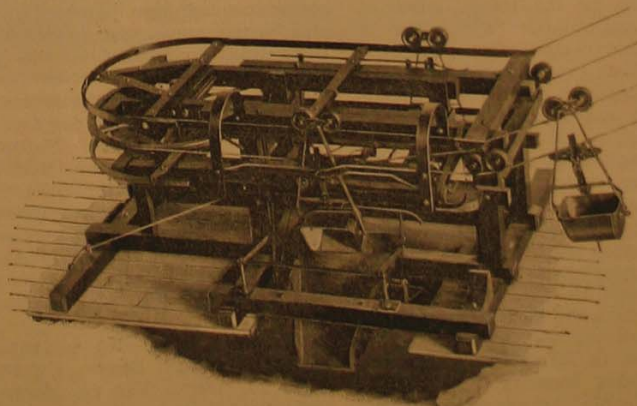


FIG. 2—LOWER, OR UNLOADING TERMINAL.

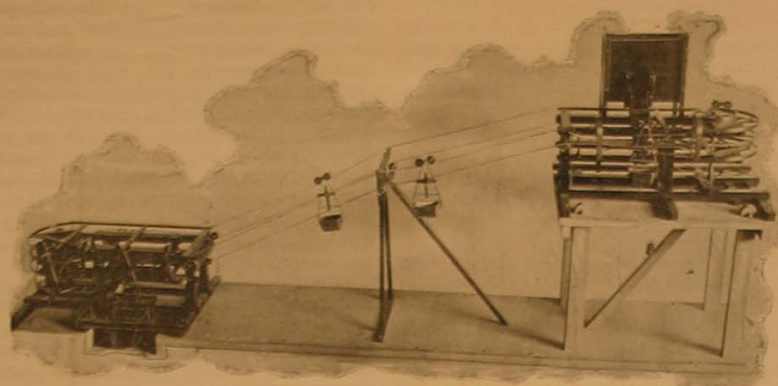


FIG. 3—TERMINALS CONNECTED, SHOWING SUSPENDED BUCKETS.

A Mill Testing Plant.

The mining and assaying interests of Southwestern California will welcome the news of the establishment in this city of a complete plant for the practical mill test by all standard methods, of ores of all grades and character. The enterprise is one which the leading industry of the Southwest has long been in need of. It is complete in every detail, and will be able promptly and accurately to demonstrate not only in percentage value of ores, but also the probable expense of milling, and the best methods to be applied.

The new mill is the result of the foresight and enterprise of the well-known assayers, Wade & Wade, who have been recognized among the leading analytical chemists of Los Angeles. For the accommodation of the requisite machinery a site has been selected at No. 234 Requesena street, and an ample building erected. The machinery is all new, of the latest model, and was selected by E. M. Wade of the firm, after two weeks' painstaking investigation at San Francisco and other points. The outfit as selected and now ready for business consists of a two-stamp mill, belt concentrator, automatic ore feeder and large rock breakers, all from the Union Iron Works of San Francisco. In connection with these a complete cyanide plant has been installed, thus enabling the operators to test by cyanide, milling and concentrating. The entire motive force is electric power.

The office and laboratory of the firm are at No. 115½ North Main street, Los Angeles. The latter has no equal in the completeness of its appointments in the western country outside of San Francisco.

A contract has been let for the construction of an electric line for the transmission of power sixty-eight miles in California. This is the longest line for a similar purpose ever built. But another even grander and more elaborate project has been mooted for the construction of a line across Kern river to Los Angeles, a distance of 108 miles. This involves the construction of a dam across the Kern river. The system contemplates a pressure of 30,000 volts. These two projects are the greatest of their kind yet attempted, but Californians never ask the expense of an undertaking; the question is, is it necessary and can it be made to pay? After all the conservatism of which the Pacific coast state is accused, Colorado can take some lessons in the matter of nerve in furnishing money for developing the mining industry. Platt Rogers, in his speech before the exposition meeting at the Mining Exchange, lamented the decadence of the splendid nerve and enter-

prise shown by Denver and Colorado before the panic. Governor Adams hinted at much the same thing. Is it not about time to quit croaking and get down to business again?—*Ores and Metals.*

Patents of Interest to Miners.

Messrs. Townsend Bros., solicitors of patents, 9 Downey Block, Los Angeles, California, report the following list of recent patents of interest to mining men:

March 8, 1898—No. 600,211. Apparatus for Washing Amalgam. Henrik C. F. Storrmer, Christiania, Norway. Filed June 26, 1895. A vessel containing a layer of mercury as cathode and a suitable anode, the mixer consisting of a plate normally immersed in and of substantially the same superficial area as the cathode, the plate being reciprocated to agitate the material.

March 15, 1898—No. 600,579. Gold Separator. W. H. Fulcher and S. E. Latta, Stockton, Cal. Filed May 24, 1897. A riffle-crib is secured to a rock-shaft, and a screen-box is also loosely suspended from the shaft; both the crib and the screen are inclined and when the crib is rocked the screen is shaken; riffles are arranged in the bottom of the crib to catch the gold.

March 15, 1898—No. 600,838. Mining Machine. George F. Myers, Boston, Mass., assignor to the Myers Mining-Machine Company, same place. Filed Nov. 18, 1896. The machine comprises cutters secured to sprocket-chains end adapted to swing in an arc of a circle, severing from the face of the drift a Crescent-shaped slice severed at top, bottom and front from the face of the drift.

March 15, 1898—No. 600,635. Quartz Mill. H. H. Crain and J. W. Forbes, Plymouth, Cal. Filed April 23, 1897. Weights are suspended from jointed links and operated by reciprocating arms so arranged that the weights are lifted from the bed on their forward movement and strike the bed with a plunging motion upon the return movement.

March 15, 1896—No. 600,620. Smelting Furnace. W. S. Reese, Natrona, Pa., assignor to the Pennsylvania Salt Manufacturing Company, Philadelphia, Pa. Filed Oct. 21, 1896. A stack smelting furnace for lead materials having a closed porous bottom, an outlet for the smelted material above the bottom, and a receptacle beneath said bottom into which the lead seeps through the bottom.

March 22, 1898—No. 601,203. Ore Car. George E. Truax, Denver, Colorado. Filed April 17, 1897. The car doors are hinged and operated by a rack and pinion arranged beneath the car; a rack is arranged upon the track at the point where the car is to be

dumped, so that the pinion engages with the stationary rack to operate to open the doors upon the forward movement of the car and to close them upon the return movement.

March 22, 1896—No. 601,212. Machinery for Extracting Gold. S. P. Moody, Magalia, Cal., assignor of one-half to Robert F. Jackson, Chico. Filed March 29, 1897. A revolvable pan has an outwardly inclined bottom and a central discharge-opening surrounded by a circular wall; rotary stirring devices project into the pan and rotate in a direction opposite the direction of the rotation of the pan; the pan is given an oscillating angular motion in addition to its rotary motion.

March 22, 1898—No. 601,068. Method of and Apparatus for Extracting Gold from its Ores. F. W. Whitridge, New York, N. Y., administrator of Ernest Werner von Siemens, deceased. Filed May 27, 1896. Patented in Transvaal July 8, 1892. No. 397. The method consists in circulating weak cyanide solution containing gold over anodes of iron and cathodes of lead, the cathodes being formed of thin plates arranged at short distances apart and having from nine to ten square meters of surface for each ton of solution in contact with them; the solution is subject, while in motion, to an electric current of iron 3.5 to four volts and from .5 to 1.5 amperes per square meter of cathode surface.

March 22, 1898—No. 601,201. Method or Process of Extracting Precious Metals from Ores. S. Newhouse, Denver, Colo., and A. J. Bettles and T. Weir, Salt Lake City, Utah. Filed Oct. 8, 1897. The method consisting first, in placing the pulverized ore in a suitable cyanide solution and subjecting it to agitation; second, adding a quantity of zinc thereto and subjecting the mass to further agitation; third, adding a quantity of quicksilver charged with sodium amalgam and subjecting the entire mass to further agitation.

March 29, 1898—No. 601,533. Method of and Apparatus for Reducing and Separating Ores. R. A. Stewart, Cerrillos, New Mexico, assignor of one-half to J. J. Vorpe and Lillie Beale, Van Wert, Ohio. Filed April 29, 1897. The combination with an ore-chamber, means for applying sufficient heat to calcine and reduce the ore to a finely divided condition, of a receptacle adapted to contain a body of water, a submerged centrifugal distributor arranged in the water, and a conduit through which the calcined ore is drawn from the ore-chamber into the centrifugal distributor.

March 29, 1898—No. 601,467. Machine for Winning Stone or Coal. Fritz H. Heise, Gelsenkirchen, Germany. Filed July 27, 1897. Two wedges having parallel outer faces and connected by a screw-spindle are arranged between expansible guiding pieces so that as the wedges are drawn together the expansible pieces are forced apart.

In a report to the Canadian Parliament, Dr. Dawson, chief of the Dominion Geological Survey, places the total yield of gold from the Canadian Yukon mines from 1889 to 1897, inclusive, at \$4,000,500. He gives the amount for each year as follows: In 1889, \$213,500; 1891, \$175,000; 1892, \$187,000; 1893, \$175,000; 1894, \$125,000; 1895, \$250,000; 1896, \$300,000; 1897, \$2,500,000.

The annual meeting of the stockholders of the Great Western (Limited) was held at Revelstoke, B. C., on April 9th.

MODERN WATER POWER.

The use of water for purposes of power dates back to the early centuries, and, even with the crude and primitive means then available was made to subserve many useful purposes. It is, however, only within a comparatively short time that it has come to be recognized as the most practicable and potent of all elemental forces, destined in the near future to do a large part of the world's work.

The advantages such a source of power offers are so many and obvious that even a reference to them seems superfluous. That these advantages have often been largely discounted by the use of appliances for utilization, either altogether unreliable or inadequate to the work intended, is unfortunately quite too common an experience.

The practice which has so long prevailed, of appropriating only the larger streams, with low heads, allowing the higher heads to go to waste, is attended with so many difficulties and such expense as to make a power so obtained often of questionable expedience.

The modern water power wheels offer so many advantages for the general utilization of all these sources of energy, everywhere abounding, that streams favorably situated for power purposes are now being eagerly sought for and appropriated.

By its use the entire force or highest head obtainable can be made available for all industrial purposes with a greatly reduced cost, wider range of application, and fuller adaptation to varying requirements, than has ever before been realized. Nothing in a mechanical way has so signally and quickly demonstrated its own usefulness as well as its right to the first place in hydraulic power appliances.

The transmission of power by electricity has opened up a new field and a wider range for the application of such sources of power, than has been possible by any previous methods, and the field is continually enlarging as the science advances. This most subtle and mysterious element has been brought under control and made subservient to industrial and commercial interests to an extent that can hardly be realized by those not fully conversant with the rapid and important developments of the past few years.

It is, however, in connection with water as an initial force that the highest development in this direction has been attained. Every stream or waterfall is a mine of energy that by means of this most simple appliance can be converted directly into useful effect with almost an entire absence of machinery, and made available for any desired purpose with a high degree of efficiency and comparatively small outlay.

Water that for thousands of years has run to waste, can now be transformed into electrical energy and carried long distances and made as useful as at the point where generated, and at small cost in most cases as compared with steam. The immeasurably vast resources of power available by this means open up in all directions new fields for enterprise, affording profitable employment for both labor and capital.

The idea of a water-power is generally associated with a river or large stream, an expensive dam—huge flume—heavy grading and stone work—massive turbine wheels—pits—curbing and penstock, all involving so large an outlay as to make a power so pro-

In this way a small trout brook will often furnish as much power as a large stream with a low head in a much more convertible form and at probably not more than one-fourth the outlay.

STANDARD MINING CO.

The cut herewith shows an application of Pelton Wheels, manufactured by the Pelton Water Wheel Co. of 121 Main St., San Francisco, Cal., to a high-speed generator by direct connection to the armature shaft. The wheels—four in number—are inclosed in two separate housings all mounted on one shaft and connected to a Westinghouse generator by an insulated coupling. They are 21 inches in

diameter, and have a combined capacity of 400 horsepower, with a speed of 860 revolutions under a running head of 340 feet. The wheels in the plant here referred to were made of this small diameter to give proper speed to the generator under the head in this case available. A slower speed generator—in conformity to modern practice—or a higher head of water, would have admitted of larger wheels, and consequently a less number to give the same power.

The current thus generated is transmitted to the works of the company, $12\frac{1}{2}$ miles distant, at a pressure of 11,000 volts. It is used for running a 60-stamp mill, pumps, hoists, &c. Fuel was exceptionally high in that locality, and it was necessary to obtain cheaper power to admit of carrying on their operation on any extensive scale.

The manager, in his report to the company, states that the cost of the entire plant was \$38,000, and that the saving effected over the previous operation of the plant by steam averaged some \$1,500 per month—thus returning the entire outlay in about two years.

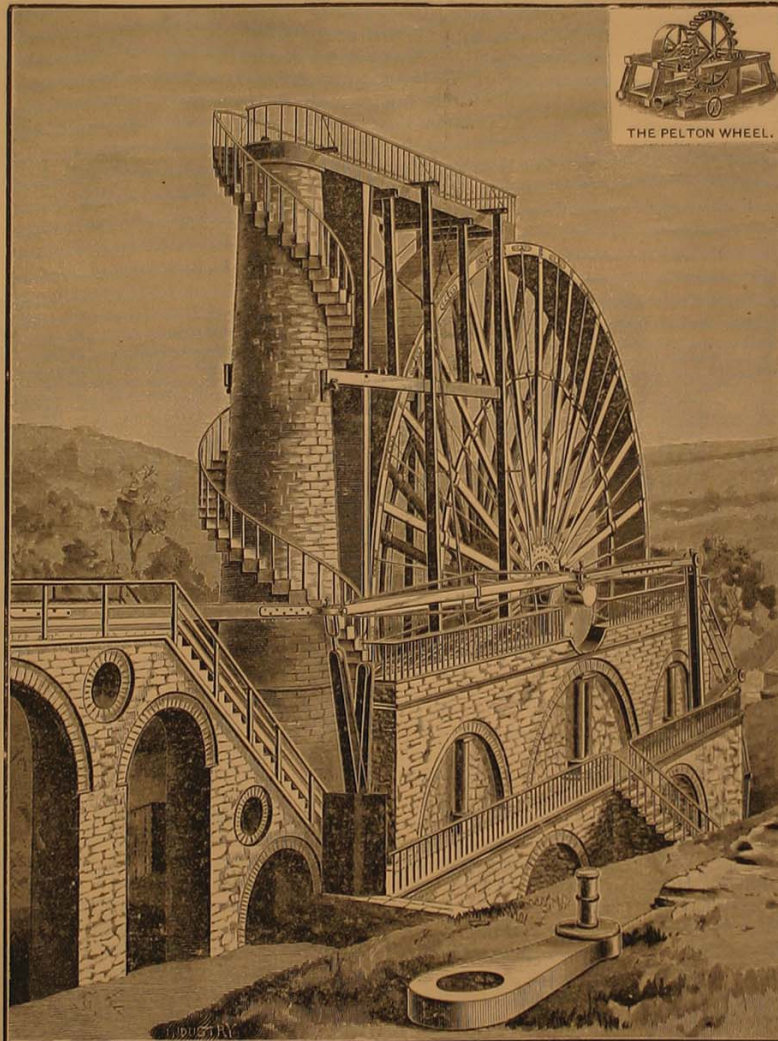
The statement is further made that in the four years the plant has been in operation no trouble has been experienced from the line, though running over a rough and mountainous country, with winter storms of great severity. Also, that no repairs have been required on either wheels or pipe line, and that the service, including regulation, has been at all times thoroughly reliable and efficient.

Considering the fact that this installation was one of the very first made for mining purposes under new and untried conditions, its success has been the more remarkable.

A COMPARISON.

The wheel illustrated with this article is of the type commonly known as the Over-shot or Gravity Wheel, and is unquestionably the largest and most expensive water wheel ever constructed. It is located at Laxey, on the Isle of Man, a small island in the Irish Sea, off the west coast of England.

"This wheel is 72 feet 6 inches in diameter,



THE GREAT OVER-SHOT WHEEL AT LAXEY
ON THE ISLE OF MAN, ENGLAND

duced of doubtful advantage, especially when so much is sacrificed in location of works as is generally necessary in such cases.

Not more than 5 per cent. of the available water-powers in any part of the world, it is claimed, have thus far been utilized—a fact not to be wondered, at considering the crude and expensive methods that have so long prevailed. By means of the present systems only a small diverting dam is required, then a pipe line running along the surface of the ground to the power station which may be located at any convenient point, and high enough to be out of the reach of floods.

and is supposed to develop 150 h. p., which is transmitted several hundred feet by means of wooden trussed rods having supports a regular intervals, to the bottom of which are attached small wheels running on iron ways, for purpose of lessening friction. The power thus transmitted operates a system of pumps in a lead mine, the duty of which is raising 250 gallons of water per min. an elevation of 1,200 ft. The water is brought some distance to the wheel in an underground conduit, and is carried up the masonry tower by pressure, flowing over the top into the buckets.

"This great wheel was constructed some 40 years ago and is said to have been running continuously during all this time. It is the great attraction of the place, hundreds of visitors making the trip to the island every year to see it.

"The illustration referred to affords a very good idea of the progress made since that time in Hydraulic Engineering and is reproduced for the purpose of showing, by way of comparison, the advantages of the modern and now generally accepted method known as the Pelton System of Power.

"The little cut in the upper corner re-

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

CORRESPONDENCE

CALIFORNIA.

(From our Special Correspondent.)

BALLARAT, INYO COUNTY, CAL.

April 8, 1898.

EDITOR JOURNAL:—Considering the excitement lately inaugurated here, by the strike made on the Mineral Hill property, this camp has progressed wonderfully. Several deals have recently been consummated.

P. H. Pheby has bought the Burro mine, and intends pushing development work. Ten thousand dollars cash was paid for this property. Mr. Pheby has bought a 10-stamp mill, and is erecting the building for the mill. The boarding houses and other necessary build-

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

assay was secured from the tailings. The ore from this mine will be worked in the Anthony mill in Pleasant Canon.

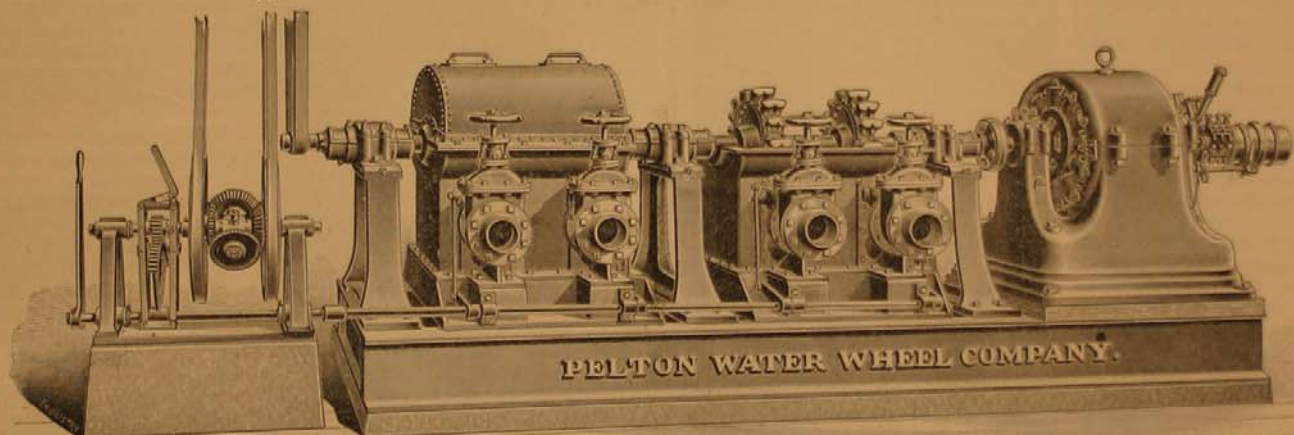
The Medreth mine is developing into a fine piece of property. The owners have a large force of men at work in the mine.

The Buckeye Consolidated Co. are hauling and milling their ore at Ballarat, in the custom mill belonging to Weaver & Porter Bros.

It is reported the Mineral Hill mines, located in Telescope Mountains, one of the highest ranges of the Mojave Desert, and in the South Park mining district, Inyo County, have been sold to New York parties.

The Telescope Range is 120 miles northwest of the town of Mojave, from which place there is a good wagon road.

There are several hundred thousand tons of \$16 ore in sight. The new owners propose to immediately erect a 5-stamp mill to thoroughly test this ore body. They expect to put up a wire rope tramway, and increase the capacity of the mill to 50 stamps. From a two-foot vein, the former owners extracted 25 tons of ore, an average value of \$74 per ton.



ELECTRIC POWER PLANT, STANDARD MINING COMPANY, BODIE, CAL.

presents a Pelton Wheel of corresponding capacity under similar conditions of head and water supply being drawn to the same scale.

The extraordinary results obtained from this well-known wheel are due to the peculiar shape of the buckets into which the water is directed from one or more nozzles, so that the full energy due to its head or fall is transferred into the inertia of the wheel. The power represented by the force of the water is thus converted into mechanical movement almost entirely without friction, the buckets simply taking the energy out of the stream and leaving the water inert under the wheel.

"The efficiency of the Laxey wheel—taking resistance into account—it is estimated can not be more than 65 per cent of the theoretical power, while the Pelton will develop fully 20 per cent more, and in size and appearance is a mere toy as compared to the ponderous piece of machinery shown, with its massive column, arches, and stone foundations.

"The most striking contrast, however, will be seen in the matter of cost, which is so much less as to make a comparison almost absurd. While no data is at hand in regard to this, it is apparent that it would be at least as one to fifty in favor of the Pelton.

"Such an object lesson is of value in show-

ings are already up. Work on the mill will soon be commenced. There are 16 men employed in the mine at the present time.

Messrs. Palmer & Co. have bought the Curus mine, at old Panamint. Two concentrators have been shipped and will be placed on the property, to be used in connection with the old 10-stamp mill, which will be repaired and the mine will be developed.

Chas. Anthony is moving his 5-stamp mill, located in Pleasant Canon, closer to water.

Weaver and Porter Bros. are putting in a custom mill at Ballarat. It is to be a 3-stamp mill.

The Bowman mine, in the Slate Range, has been sold to New York parties for \$25,000. There is a 100 foot shaft and 50 feet of drifts on this mine. The vein is 40 inches. From test of 18 tons, the ore free mills \$20 to the ton, while the assay returns are \$35 per ton.

Montgomery Bros. are working 27 men. The Bryan mill is kept busy working 15 tons of ore a day.

It is reported the Radcliffe mine will soon start producing ore again. This mine has 800 feet of tunnels and 2 shafts. The vein averages 6 feet. A 25 ton test, by a stamp mill, showed \$15 free milling ore, and a \$10

COLORADO.

(From our Special Correspondent.)

BOULDER, COLO., March 31, '98.

EDITOR JOURNAL: Gold mining is the most seductive and fascinating industry of this age. Fortunes are made sometimes in a brief season and lost by speculation. In this county men are gone wild over the new camps, and great strikes made in our mines during the past few weeks, and the influx of miners and speculators is something wonderful. Stages, coaches, buggies and private rigs are crowded to excess for the several mining towns, while our new Colorado and Northwestern railroad has all it can carry with the present facilities and power.

Wall street has become the magnet of attraction by the wonderful impetus that has been given to the camp during the past few weeks, resulting from the rich strikes made in the properties owned by the Gold Extraction, Mining and Supply Company. Ore that will run from \$10 to \$20 per pound has been found in quantities, but the great values are contained in mineral that is selected for the smelter, wherein the vein matter is quite large, containing considerable stamp mill stuff. Following these numerous strikes real

estate has increased in value 50 per cent., surveyors are staking off lots on both sides the gulch which are bringing good prices, houses are being built for the accommodation of the miners and business men, lots are being graded and work is going on in every stage of construction, and a more lively camp cannot be found in our State. The boom is upon us because of the superior excellence of the mines in this immediate section, and the grand mineral output. The G. E. M. & S. Co. has built and owns a two-story office, a two story boarding house 25x40, a general store 50x80, well stocked, an assay office with all the modern improvements for good work, commodious stables, a tool or material house, and a pretty club house for the accommodation of the workmen and parties residing in the camp. Periodicals, magazines and daily papers are furnished by the company, and a weekly newspaper is issued, giving the mining news of this county. There is a new 10-stamp mill running regularly on the low grade ore to good advantage, amalgamating and concentrating the stuff that will not pay to ship and treat. A tunnel site has been patented 6000 feet in length, which will cut 110 veins along its trend through the mountain. The tunnel is 8x7 in the clear, well timbered, and furnished with a double track, while a complete blacksmith shop stands at the entrance. An air compressor and drills make 150 feet per month in the tunnel, and as each vein is encountered men are put to work developing it. Experiments are being made in the company's laboratory and assay office on the several classes and grades of mineral composing the veins owned by them, for the purpose of deciding the best process to treat the ores which are here in great abundance. Over \$25,000 net was taken out of the Franklin in a few months by development, and twice that amount could have been mined by stoping. Yesterday President Charles W. Caryl purchased the Concord mine, consideration \$50,000, and will run it to its fullest capacity and make it a constant shipper to the smelting works. This new addition to his other properties will make it one of the strongest and most extensive mining operations in Boulder county.

On Puzzle mountain, Ward mining district are the Ward-Rose and Chief mines, which have lately jumped into prominence and caused a furor in mining circles by the magnificent ore bodies that have been exposed in these properties during the past month. The Rose mine is 160 feet deep, and has paid expenses for sinking and drifting without stoping a fathom of ground. The vein will average 3½ feet thick throughout the workings, the ore is sulphide, carrying values from \$140 to \$200 per ton when selected, while the mill dirt averages from \$15 to \$25 per ton. About 500 tons of the poorer grade lies on the dump for treatment when the new railroad reaches this point, and transportation to Boulder is reduced to \$1 per ton, and treatment for \$2 a ton; then this property will be a bonanza. A fine body of ore was uncovered in the bottom of the shaft on Saturday last, and several tons are ready to ship to the smelter. The mine has a new Corliss engine and hoisting plant, a fine shaft house, and every convenience for extensive mining operations.

The Chief mine is being unwatered, a new engine having been purchased and placed in position for this purpose. The vein is large in this mine, and will be extensively opened in the future. Superintendent Frank W. Davis is very much elated over the outlook

for large production of high grade from these mines during the summer.

The Golden Age mine produced this week three pounds of ore and free gold that is worth \$200 per ton. This ore is sawed into thin slabs for jewelry. Twenty-three pounds brought \$50 per pound, and 66 ounces of retorted gold was sent to the mint, besides 300 pounds of ore that netted \$5 per pound. The regular ore was sent to the sampling works, from which no returns have been received at this writing. This is the best record I have ever heard from any mines in the United States. I will state that the specimens are sold at \$20 per ounce by the leasers who struck this rich pocket of black telluride of gold and pure gold last week. In my article of March 3, on the Golden Age mine, in speaking of the very rich ore, I said: "But it certainly pays to exercise much care when taking out ore that yields \$20 to \$30 per pound" (not ton as stated in your issue of March 15). Our rich telluride ores are always sold by the pound, as it would require a lifetime almost to accumulate a ton of ore that would sell for \$200 per pound or \$400,000 a ton, such as the Sherman Bros. and Dubi mined this week.

WILLIAM M. RULE, M. E.

The Pelton Water Wheel Co. have recently issued a new edition of their catalogue, which embraces a vast amount of tabular and descriptive matter, relating to the means of utilizing water powers by the Pelton system, making quite the most valuable contribution to modern hydraulic literature that is now available.

Much attention is given to the generation of power for electric transmission which is now the absorbing question in electrical science. Upwards of one hundred and forty electric power stations are listed as having been installed by the Pelton Company within the last three years, aggregating some 80,000 horse power wheels, running under heads varying from 40 up to 1700 feet. The system here described makes possible the utilization of this source of energy under a wide range of conditions and with a degree of economy, simplicity and efficiency never before attained.

Engineers, as well as parties interested in the development of water powers, will be furnished a copy upon application to the Pelton Water Wheel Co., 121-123 Main Street, San Francisco, Cal.

A Belt Dressing.

It is the slipping heel that wears the hole in the stocking, and it is the slipping belt that wears the leather. Belts that slip not only do not drive properly, but they wear out rapidly. A thoroughly reliable belt dressing is therefore a necessity in every well regulated factory, and probably no dressing has such a world-wide reputation as Dixon's Belt Dressing and Leather Preservative.

As long ago as 1878, it was used on the big driving belt at the Paris Exposition, when every other means had failed to make the belt take hold of the pulley that was to start the thousands of feet of shafting and hundreds of machines. Those who use Dixon's belt dressing claim that it prevents slipping and thoroughly preserves the life and elasticity of the belt. It is made only by the Joseph Dixon Crucible Company, Jersey City, N. J., who are known the world over for their graphite products.

GOLD MINING IN THE BLACK HILLS.

BY PROF. H. O. HOFMAN,
Of the Dakota School of Mines, Rapid City, Dakota.

(Continued from our issue of Feb. 1st, 15th, Mar. 1st and 15th.)
Subjects treated upon in preceding issues are as follows:

I. THE ORES.

Character of the Ores.
Sorting of the Ore.

II. ENUMERATION OF MILLS.

III. OUTLINE OF PLANT AND PROCESS.

IV. GENERAL FEATURES OF THE MILLS.

Distribution of Power.
Supply of Water and Fuel.
Auxiliary Arrangements.

V. THE MILLS IN DETAIL.

Grizzlies.
Rock Breakers.
Ore Bins.
Feeders.
Battery Foundations, Frames and Guides.
Battery Frames.
Guides.
Mortars.
Dies.
Screens.
Stamps.
Cams and Cam-Shafts.

Crushing-Capacity.—The crushing capacity of a battery depends on the efficiency of the stamp (that is, the number of foot-pounds developed), the character of the rock under treatment and the discharging capacity of the mortar (that is, the height and size of mortar at the discharge, the character of the screen and the width of the mortar at the discharge). The Homestake stamp weighs 850 lbs. and drops 9 in. 85 times per minute, thus it develops 78,030,000 foot-pounds in twenty-four hours, crushing 4½ tons of rock, or one ton for every 17,340,000 foot-pounds developed. The Caledonia stamp weighs 850 lbs. and drops 12 in. 74 times per minute, developing 90,576,000 foot-pounds in twenty-four hours, crushing 3.3 tons of rock, or one ton for every 27,447,272 foot-pounds developed. Thus, although the efficiency of the Caledonia stamp is greater than that of the Homestake, it crushes less ore. There are several reasons for this. First, the character of the rock, which is much harder than that at the Homestake; second, the width of the mortar at the discharge (16 in. against 13½ in.); third, the 2 in. recess for the 8 in. amalgamated copper-plate below the feed, which is absent in the Homestake mortar. From the lower discharge of the Caledonia mortar (6 in. against 10 in.), a greater crushing capacity would naturally be expected than from the Homestake mortar. The above reasons will explain why this fails. The smallness of the Caledonia screen (258 sq. in. against 376 sq. in.) may be assumed to be counterbalanced by its character (Caledonia No. 24 wire against Homestake No. 7 slot, which corresponds to No. 30 wire). The Caledonia Co. claims that more gold is recovered by its slow method than by the more rapid one of the Homestake. This point could only be definitely settled by exact tests.

Apron-Plates.—In order to save the fine particles of gold that have not been caught on the inside copper plates and to collect any amalgam and quick-silver that have passed through the screens, an amalgamated copper-plate, the apron-plate, is placed in front of the

mortar. The motion of the battery water, caused by the dropping of the stamps, throws with the drop of each stamp some pulp against and through the screen. This, passing over the lip of the mortar, flows in small waves over the apron-plate. During the slight interval between these waves any heavy particles of the pulp (quicksilver, amalgam or fine gold) passing over the amalgamated plate have a chance to settle upon, adhere to and combine with it. The plate consists of one sheet of copper nearly as wide as the discharge of the mortar, fastened with iron screws to the inclined wooden table beneath it. In all the Homestake mills (except the Deadwood and Golden Terra, where it is 12 feet long) the copper plate, 3-16 in. thick, is 10 ft. long, falls 2 in. to the foot, and discharges into a copper-lined trough, leading to the mercury-trap. The apron-plates of the Caledonia are 8 ft. long $4\frac{1}{2}$ feet wide, and the copper is $\frac{1}{8}$ in. thick. They have the same fall. The wooden table extends 4 feet beyond the end of the copper plate, at the same time narrowing to a width of 4 feet. It has a 1 in. rib down the center and is overlaid with two blankets, 5 ft. wide and 22 in. long, the upper overlapping the lower. On these the heavy sands collect. Each is washed every half hour in a tank. These blankets last six months. Carpets were tried, but they frayed and had to be thrown out after one month. The pulp from the blankets flows into the mercury-traps, one being placed in the middle of the discharge for every plate.

The plates are of Lake copper, furnished to the mills ready for use, and do not require any annealing to make them porous. They have, however, to be flattened with wooden mallets to make them lie smoothly on the wooden table and to remove any inequalities produced during transportation. At the Homestake mills they are first scoured with sandpaper, followed by emery cloth or with tailings and a wooden block 4 in. square, or with a grindstone, until the face is perfectly bright. If necessary, the sand is moistened with a weak solution of potassium cyanide, and spots are often removed with dilute nitric acid. The surface of the pure metallic copper receives a solid coat of potassium cyanide, which is applied repeatedly as a strong solution by means of a soft paint brush. After two days the mercury is sprinkled on this cyanide coat and rubbed into the plate with a moist cloth and tailings. When the plate is thoroughly amalgamated, it is put into place and is ready for use. More than the usual amount of mercury is added to the mortar, that the new plate may become normal. This takes from two to four weeks, during which time the plates are continually discolored by copper salts. To get these into solution, potassium cyanide or ammonia is added to the battery-water. At the Caledonia mill the procedure is similar, only more care is taken to saturate the plate with mercury before it is put into use. Only the ordinary quantity of quicksilver is then added to the mortar with a new plate. In none of the mills are the plates coated with amalgam before they are put to use, nor are there any silver-plated copper plates used in the district.

The Mercury-Traps through which the pulp passes on leaving the apron-plates, save amalgam and quicksilver not collected on the apron-plates. There are additional traps at the termini of the sluice-plates outside. At the Homestake mills the pulp formerly flowed from the apron-plates directly over the sluice-plates into the waste flume. Then the traps were introduced. How important this single

contrivance is, can be seen from the fact that in the Homestake 80-stamp mill there are recovered every month, by the inside traps, 80 oz. of amalgam and 144 of quicksilver; by the outside traps, from 10 to 12 oz. of amalgam and 40 of quicksilver. These traps are emptied only once a month. If they were emptied twice a month on clean-up days, a still better showing could perhaps be made. At the Caledonia, the traps are emptied daily, when the apron-plates are being dressed; this is done because of the accumulation of concentrates.

At the Homestake mills, the inside trap consists of a wooden box, with copper-lined bottom, 14 in. long, 17 in. wide and 24 in. deep. It contains three sliding wrought-iron plates, parallel with its short sides. These are placed $2\frac{1}{4}$ in. apart, the center one extending to the bottom of the box, the others to 3 in. above it. The pulp flows under the first, over the middle one, and again under the third. The outside trap is larger. The wooden box is 48 in. long, 14 in. wide and 48 in. deep. It has three partitions, set $10\frac{1}{2}$ in. apart, reaching from the bottom of the box up to $1\frac{1}{2}$, 3 and 4 in. below the level of the inlet, the outlet being 6 in. below this. In the middle, between two wooden partitions, is let down a sliding wrought-iron plate, $\frac{3}{8}$ in. thick, reaching to 3 in. from the bottom of the box. The Caledonia traps are much smaller, since there is one for each apron-plate.

The Sluice-Boxes, receiving the pulp from the inside traps, are simply wooden troughs with copper-lined bottoms. At the Homestake mills they are from 8 to 10 feet long, 18 in. broad, and have a fall of 1 in. to the foot. The copper used is $\frac{1}{8}$ in. thick. At the Caledonia mill they are 8 ft. long and only 8 in. broad, as less pulp passes through them. The main sluice into which they discharge is 2 ft. square.

VI. LABOR IN THE MILLS.

All the heads in the different departments are responsible to the superintendent. The mill proper is in charge of a foreman, thoroughly acquainted with every detail of work. One foreman often has the general charge of several mills, as with the Homestake and Deadwood Terra companies. Next comes the millwright, who sometimes has, as in the Homestake mill, an assistant called the pipe-fitter. The millwright combines the trades of carpenter and machinist. His duty is to make the guides, put them in place and keep them in order; to exchange cams and camshafts, fasten any cams that have become loose, make and replace screens, make and repair chuck-blocks, to reverse and exchange shoes and dies of crushers and to look after all the piping in the mill; in one word to erect and keep in order every part of the mill for which any mechanical knowledge is required. One of his duties, for example, consists in lining all the shafts and in babbiting their boxes.

In this connection might be mentioned a method of lining shafts, which originated with Mr. R. Graham, the millwright of the Homestake Company, and which has proved to be quick and effective. When a shaft is to be lined, the boxes are placed so as to be approximately in line. The lower bearing, which is to receive the shaft, is loosely packed with clay and a wooden center pressed into it. This consists of a semi-cylindrical piece of dry wood having the same diameter as the shaft and about the length of the box. The wooden centers of two or more boxes are now care-

fully lined and the clay packed tightly around them. When in line the centers are removed, one after another and the clay cut out crosswise in the middle of each box. The center is then replaced and the hollow space filled by pouring in babbitt. The center and remaining clay are then removed and upon the ribs of babbitt (in the middle of each box) is placed the shaft, which is now accurately in line. Finally the space left is filled with babbitt. In this way the shaft can be quickly and accurately lined, the bearings will be absolutely true and the lining from $\frac{1}{2}$ to $\frac{3}{8}$ inch thicker than the ordinary $\frac{1}{4}$ inch lining; consequently the shaft itself will last longer.

After the millwright comes the machinist. The Homestake Company having a large shop, all repairs are made there. At the Caledonia mill the foreman is also machinist, and any extensive repairs are made by the Homestake Company.

As the mills are driven by steam, each one has two engine-men, who are responsible for their firemen. To guard against fire or any other accident, there is generally a night watchman for every mill. These men are directly responsible to the foreman.

Miscellaneous Mining News.

ALASKA.

A most terrible disaster has overtaken nearly one hundred souls, who were rushing to the Klondike to seek their fortunes in the frozen ground of that God forsaken land. On April 3rd, an avalanche of snow descended Chilcoot pass, taking everything in its path, and as details are received, the horror is increased instead of lessened.

The names of one hundred and fifty missing have been reported as unaccounted for, though it is barely possible that some of these succeeded in crossing the pass before the avalanche occurred.

A fact that lends horror to the fearful tragedy is that it may never be known with any degree of accuracy just how many lives were sacrificed, who they were or where they came from.

Many a poor fellow lies buried where no human aid can reach him, and where his remains must rest until the summer sun melts the tons of snow and ice under which he lies buried. Upon the crowded trail no record was kept of the living, toiling mass, braving hardships and facing death in the mad rush for gold. *Transact in exemplum.*

ARIZONA.

The Tennessee ore shoot is growing larger as work progresses, and it is now of large size and good grade.

Several more leasers have gone to work on the Nighthawk. They will put up a gasoline engine and pump and work below the lower tunnel.

Tom Johnson's mine at Chloride continues to produce solid ore, and is now among the paying properties. Their shaft is down nearly 100 feet.

O. F. Kuencer will start up the Esmeralda Mine as soon as the preliminaries can be done. Charles Richards will have charge of the mine. The Esmeralda has a steam hoist on it, and the main shaft will be sunk deeper and levels run.—*Mineral Wealth.*

George Young and Mr. Simpson have commenced the erection of a concentrating plant

at Dos Cabezas, Cochise county, to work some placer ground that will average \$10 per ton.

The drift in the lower workings of the Gladiator, near Prescott, Arizona, is now in between 90 and 100 feet, and is still in the high grade body of sulphide ore encountered a short distance from the shaft. This ore body gets stronger the further they have penetrated it. The mill is running day and night and there are about 40 men employed at present at the mine.

J. C. Underwood, who had an interest in some mines at Kirkland, Arizona, has disposed of his interest to the Springfield Mining Company of that place. The properties which Mr. Underwood owns an interest in are some of the best to be found in Arizona, and the purchasers are well pleased with their bargain. With some development these mines will be made producers of the finest. Mr. Underwood still has some properties in the district, which he will prospect and develop in the near future.

CALIFORNIA.

KERN COUNTY.

N. D. Burlingham has returned from the mines in the Sugland district, near Pah Ute mountains in Kern County. The five-stamp mill is completed and in operation, crushing from eight to ten tons of \$12 ore daily. Concentrators will be added shortly. The Golden Crescent Mining Company owns the properties in which Mr. Burlingham is the chief stockholder.

There is a great deal of activity in the mines around Randsburg just at present, and many of them are turning out big profits. About fifty tons of Kinyon ore have just been run through the mill. The output was \$6500. Selected small amounts of ore from the Maganetta run \$200 to the ton. The Little Butte is said to have a quantity of \$45 ore at the bottom of its shaft.

From Johannesburg word comes that several mines are yielding \$20 ore.

SAN BERNARDINO COUNTY.

The Colorado Iron Works Company, of Denver, Colo., made another shipment of three carloads of machinery for the Randsburg Santa Fe Reduction Co., at Barstow, California. Up to date eight carloads have been shipped for this new mill now being erected at the above place.

Cortelyou & Giffin are interested in a splendid copper mining property in San Bernardino County, which Mr. Giffin has lately expeted. The claim is being developed, and it is said will be placed upon the market.

The large ore bodies of the Blackhawk mines, probably the largest in that section, have good prospects of being worked again to advantage. J. B. Cook has sold out his interest in the mines, and there is prospect of sufficient capital taking hold to run the mines as they should be, and if so the result will be very remunerative.

SAN DIEGO COUNTY.

In the Vallecitos, "Peachland," numerous prospectors are busy attempting to locate paying claims. John E. McIver has unearthed tin ore on his place very similar to the Temescal ore, and in all probability has

struck a good thing. His brother, D. B. McIver has some fine looking specimens of gold ore, identical with the Cripple Creek product, and which has assayed very high. Mr. McIver now thinks he has discovered the main ledge. M. E. Bidwell and Clark and McIlhane also hold some promising prospects.

J. Farnsworth, of the North Star Mine, San Diego County, in connection with other parties, is erecting a five-stamp mill on the mine. The several hundred tons of ore worked at the Banner Mine will average over \$30 per ton.

C. F. Holland, of the Elevada Mine, has a force of men reopening the property. A recent run of about 100 tons yielded \$9,000.

SHASTA COUNTY.

A ten-stamp mill is to be erected at once by the San Francisco owners of the old Spanish claim in the Lower Springs, Shasta County, mining district. The machinery is being moved on the premises now.

COLORADO.

The output of the Cripple Creek camp for the month of February, the shortest month in the year, is encouraging, to say the least. The stamp mills of the district were practically idle during the month. Summarized, the output is as follows:

	Tons.	Average.	Tot. Val.
Smelters	10,000	\$60.00	\$ 600,000
Reduction Works	23,730	24.70	586,600
Grand total....	33,740	.....	\$1,186,600

The Mic-Mac Company filed articles of incorporation last week, at Georgetown, Clear Creek County. Development work has been going on at the mine for some time, thirteen men being employed. The shaft is down 220 feet, and shows an 8-inch vein of $3\frac{1}{2}$ ounce ore. The drifts which are being driven ahead, are also in ore.

The lessees of the Gold Dust in Illinois Gulch, Summit County, have completed timbering the tunnel, and are again in good free milling ore. The last lot treated from this lease ran over five ounces in gold per ton.

The Sedalia Mine, at Leadville, is shipping sixty tons daily of gold ore to the Arkansas Valley sampler. Besides this, much expensive development is under way. Superintendent Terrence Connors has charge of the mine.

The Pawnolis Mine, on the north side of the Evans Gulch, near Leadville, is employing eighteen men on development work. This enterprise, if successful, will open an entirely new territory. Messrs. McGeorge and Emerson are largely interested in the proposition.

IDAHO.

The Bedrock Dredging Company has 250 acres of ground in Boyle's and California Gulches and Wolf and Granite Creeks. The property is so located that it cannot be worked by old methods. The company will put in a bucket dredge. The machinery is to arrive at Boise in about a month.

MINNESOTA.

The first vessels for ore arrived at Two Harbors March 24th. This is the first year on record in which vessels got in before April 20th. Ore trains were put on March 28th, and there are vessels in port to load 20,000 tons. This ore is all from No. 4 stockpile of

the Chandler, whence early shipments were necessary. Ore will not be going to docks at Duluth for two weeks yet. The extension there of No. 2 dock for the Duluth, Missabe and Northern road is about completed, and 400 ore cars for the Missabe road, built at Pullman, are expected to be ready in a month.

The explorations at the Southall Iron Company's Mine may be stopped, as a result of troubles into which Mr. Southall has fallen in connection with the government engineer's office at St. Paul.

MISSOURI.

The Albatross Mine, two miles north of Alta, now has in operation two large steam pumps, two steam end pumps, one Hooker pump and two double-action force pumps, the whole having a capacity of 360,000 gallons per hour, the largest and most complete plant in Southwest Missouri. The mill can handle 100 tons a day. The shafts are down 215 feet, with good blende below 146 feet and plenty of mineral in the bottom of each shaft. Capt. S. O. Hemenway is the manager; Frank Reily superintendent.

MONTANA.

The leasers who are working on the Broadway at Iron Rod have 50 tons of ore ready for shipment.

The Twilight Mining Company at Iron Rod received returns from 13 tons of ore taken from that mine recently.

Mr. Holmes, who bonded the B. & L. mine at Washington Bar last fall, has four men at work driving a tunnel on the vein, and no doubt will develop a good paying mine.

Mr. Westbrook, of Castle, says he is still taking ore out of the Stewart Mine. He will commence to ship ore again just as soon as the roads get in a condition for either sleighing or wheeling.

An additional force has been put on at the Snowshoe Mine, which will hereafter be run to its fullest capacity. Its output will be greatly increased next season.—*Western Mining World*.

The Colorado Iron Works Co. are building a set of 54"x8" high speed, narrow face rolls for the Anaconda Copper Co., Anaconda, Mont.

NEVADA.

The 40-stamp mill concentrating plant, built by the Colorado Iron Works Company, for the Dexter Mining Company, at Tuscarora, Nevada, began operation on February 3rd. This mill is an up to date one in every respect, the ore being handled automatically from the time it is mined until it reaches the tailings pond at the cyanide plant.

Prospectors will soon commence the work of searching for gold mines in Ellsworth and Marble Falls districts, Nye County. It has been known for several years that gold exists in the districts named, but it is claimed that for lack of funds the prospectors were compelled to cease their explorations.

It is rumored that the gold mines in Montgomery district, Nye County, have been sold to a wealthy company. Should the rumor prove well founded, that mining district will be one of the liveliest and most prosperous districts in Nevada.

NEW MEXICO.

A short time ago the estate of the late Senator George Hearst purchased the plant of the Silver City Reduction Company, and its future manager will be D. B. Gillette, jr., well and favorably known. The new management is now treating 200 tons of ore daily, and it is the intention to considerably increase the capacity of the plant and equip it with all modern appliances for the successful and cheap treatment of ores and concentrates.

Output of Hillsboro gold mines for the week ending Thursday, March 17th, 1898, as reported for *The Advocate*:

	Tons
Wicks.....	20
K. K.	10
Richmond.....	40
Happy Jack.....	10
Snake Group.....	65
Opportunity.....	15
Sherman.....	5
Prosper.....	5
Eighty-five.....	5
Rex (silver-lead).....	5

Total..... 180

Total output since Jan. 1, 1898.—2,210.

OREGON.

Messrs. Stevens and Calvert, who have lately opened up a rich channel on Pleasant Creek—one that is believed to be the original bed of the stream—brought in a nice little clean-up this week, says the *Oregon Mining Journal*, at Grant's Pass. It consisted of \$330 worth of gold, including one nugget worth \$50.

The Ball Mine, located on Eddy's Gulch, near the old Klamath Mine, is being operated by the Ohio Mine and Milling Company, under the supervision of L. D. Ball, of Ohio, who is meeting with very good results. He has recently run a tunnel about 35 feet from the main tunnel, and struck a very rich ledge of ore. He had just finished milling 95 tons of ore which paid him \$18 a ton.

SOUTH DAKOTA.

Homestake Mining Company has paid its 239th dividend of 25c. per share (31,250). Settlement was made March 25, by the transfer agents, Lounsbury & Co., in New York City. Including this dividend, there has been paid out \$6,650,000 to date.

Wasp Number 2: A large shoot of ore has been uncovered on this property in the Yellow Creek district. The ore lies on quartz, and has an average value of \$45. Vein is 50 feet wide and five feet thick.

Golden Hill: The steam hoisting works have been started up at this mine. The shaft is 90 feet deep. The Squaw Creek Mining Company has commenced working its ground in the Squaw Creek district.

UTAH.

Although the company had sufficient money in its treasury, the Bullion Beck directors did not declare a dividend, but the indications are that payments will commence next month.

The mill of the Chloride Point Co. is still lying idle, and the ore shipments to the smelters seem to be less frequent.

The Dalton will probably levy an assessment of ½ cent a share in a few days.

Geyser-Marion mines are in splendid condition, and it is expected dividends will soon be declared. The stock is now in stronger hands than ever.

The increase in the Geyser mill capacity is being rushed ahead and that plant will have been closed down for a time.

Arrangements are again being made to increase the mill capacity of the Mercur Mine. The mines are making a magnificent showing.

The pipe line to the mill of the Northern Light, which has been frozen for some time, will soon be reopened and operation resumed.

WASHINGTON.

The following meetings of stockholders of mining companies are advertised to be held in Spokane, Washington:

The third meeting of the stockholders of Helen E. Mining Company took place on April 4th.

The annual meeting of the Crystal Butte Gold M. and M. Co. will be held on April 18th.

The annual meeting of the Tom Thumb Gold M. and M. Co. was held on the 25th of March.

FOREIGN MINING NEWS

BRITISH COLUMBIA.

Supplies are being rawhided to the well-known Slocan mine—The Noble Five, which is expected under its new controlling owners again to prove a large shipper and goodly profit earner, after a period of temporary financial collapse, due to lack of capable administration. More substantial moneyed men are now understood to be behind The Noble Five.

The Velvet, a Rossland mine has now shipped 400 tons of ore, all got out in the course of development. The owners regard this as an encouraging omen, since The Velvet has now, although a very young mine, shipped almost as much ore since the beginning of the year as the War Eagle or the Iron Mask. The War Eagle will, however, again become a very big shipper almost immediately.—*British Columbia Mining Critic*.

The Blue Bell group of five claims, near Illecilliwaet, has been bonded by Mr. I. G. Syme, on behalf of a London syndicate. A considerable amount of development work has already been done on this property, which is regarded as one of the most promising in the district.

MEXICO.

Chihuahua.

The building of the Parral branch of the Mexican Central, as also of the Chihuahua Pacific Railway is causing unusual activity in the mining districts opened up by these lines. As one of the most serious drawbacks heretofore experienced has been the lack of quick communication to these extensive mineralized regions. The new concentrating and smelting plant in course of construction at Juarez will also farther assist in the development of the mineral resources of this state.

Mexico.

Rasmus Hanson, a well known Colorado

mining man, has taken an option on some of the extensions of the Esperanza property, which he is going to develop. There is unusual activity all over this state, the investors being generally substantial men. Jesse Grant is now at his property in the lower part of this state.

Sonora.

In the Creston mine the large body of rich ore recently encountered by a crosscut has proven to be a continuous vein parallel to the old lode. As the ore is high grade the discovery is very valuable, and will make this property a property a bonanza.

LOWER CALIFORNIA.

The Lacy Brothers of Los Angeles have what is known as the Barenos mines, at San Francisquito, on the Gulf side of Lower California. Recently, while drifting from the twenty-five foot level, they struck an eleven-foot vein of remarkably rich ore.

Thirty men are employed at the property at the present time—this force will be increased in the near future.

PERSONAL NEWS ITEMS

CHARLES O. RICHARDSON, mining engineer, of Pueblo, Colo., is at present in Chicago.

CHAS. BUTTERS sailed hence from South Africa on the 8th ult, and is expected here this month.

D. KEITH, managing owner of the Silver King mine at Park City, has taken a trip into Mexico.

T. J. PARSONS, Vice-Pres. California Miners' Association has returned to San Francisco from Nevada City, Cal.

HENRY F. HOYT of St. Paul has been in Joplin, Mo., examining the property of the Hermit Mining Company, in which he is interested.

F. E. GOODHEART of London, England, will arrive in Utah shortly to visit the Mammoth mine, of which he is one of the heaviest share-holders.

PERCY WILLIAMS of Silverton, Colo., has been appointed agent for the Philadelphia Smelting and Refining Company in the North-west, with headquarters at Northport, Wash.

The Monitor Tunnel Company of Butte was incorporated at Helena, by JOSEPH H. MORONG of Chicago, and THOMAS T. BAKER and WILLIAM S. SWITZER of Butte, Capital \$300,000.

GEO. E. AMES, for many years agent of the Union Iron Works, and one of the oldest and best known mining engineers in the United States has accepted the position of consulting engineer of the Anaconda, Montana, Copper Co., and left this week for his new home.

MELLVILLE ATTWOOD, the veteran mining engineer and assayer, is reported in his last illness at his residence in Oakland, Cal. Mr. Attwood made the first assay of Comstock ores in '59, and for over sixty years has been identified with mining and metallurgical interests in Europe and America.

Among the prominent mining men in the city during the past week we note the following, says the Butte, Montana, *World*: L. C. PARKER, Garnet; E. J. HOLLAND, Philipsburg; COL. W. F. SANDERS, Helena; M. C. GRAVES, Ruby mine; E. F. HOLLANDER, Denver; R. P. WHIPPLE, Diamond Hill; R. C. DUNCAN, Pony.

A. E. SALVEN, general manager of the Grangesberg mines at Grangesberg, Sweden, and CLAES LANDEN, civil engineer of the same corporation, have been at the principal iron mines of the Menominee range in Northern Michigan, the Calumet & Hecla copper mine, and the Mesabi iron range in Northern Minnesota.

GEORGE SIMMONS, the discoverer and present owner of the True Blue Turquoise Mines in Southern Nevada was one of the callers at the JOURNAL. Mr. Simmons is now in possession of the largest cut Turquoise in the world, the weight of which is one hundred and forty-seven karats and is the most perfect gem now extant. Some of the specimen shown the JOURNAL were the most beautiful ever examined. Gems from the True Blue Turquoise Mines are absolutely guaranteed to retain their color.

Acids.

Consumptive demand is satisfied by the deliveries booked orders; otherwise business is dormant. Prices are pretty steady.

Prices are per 100 lbs. in New York and vicinity in lots of 50 carboys or over. Quotations are as follows: Acetic acid, commercial No. 8 \$1.40 @ \$1.55; redistilled, 28 per cent., \$2.00 @ \$2.15; Muriatic acid, 18 per cent., 1.00 @ \$1.37½; Nitric acid, 36°, 3¼ @ \$4.3½; 38°, \$3.50 @ \$4.40; 40° \$3.75 @ \$4.67½; 42°, \$4.¼ @ \$5.00. Oxalic acid, \$6.50 @ \$7.00. Mixed acids, according to mixture. Sulphuric acid, 66 per cent., \$1.00 @ \$1.65. Chamber acid, 50° \$6.50 @ \$7.50 per ton at factory. Blue Vitriol, \$3.25 @ \$3.50 according to grade and order.

BRIMSTONE.

Demand continues moderate. No arrivals are noted, and prices are about as last quoted. Best unmixed seconds, \$22.50 for spot, and \$22 to arrive, while thirds are \$21 @ \$22.50 per ton, respectively.

MURIATE OF POTASH.

We quote New York and Boston, 1.75 @ \$1.78c. Philadelphia and Norfolk, 1.76 @ \$1.79½c.; Charleston, Savannah, Wilmington and New Orleans, for 80 @ \$5 per cent. basis of 80 per cent., \$1.00 @ \$1.03½c. in lots of 50 tons and upward.

KALIN.

Invoice weights as taken at port of shipment per ton of 2,240 lbs. testing 12.4 per cent. actual potash, equivalent to 23 per cent. sulphate of potash, \$8.80 @ \$9.15 @ \$9.30.

NITRATE OF SODA.

No change in demand; freights are high from the coast and market quotations are \$1.77½ for spot, \$1.75 for next arrival, and \$1.55 for futures.

FINANCIAL NOTES.

The statement of the United States Treasury, on Thursday, April 7th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	Mar. 24.	April 7.	Changes.
Gold.....	\$171,867,761	\$176,688,305	\$4,820,544
Silver.....	10,735,095	7,313,428	D. 3,421,668
Legal Tenders	39,361,927	37,454,711	D. 1,907,216
Treas. Notes,			
etc.....	4,071,172	3,521,734	D. 449,438
Totals.....	\$226,035,855	\$225,978,179	D. \$57,677

Treasury deposits with national banks amounted to \$31,643,782, an increase of \$362,505 during the week.

Gold and Silver Exports and Imports.

At all United States ports, February, 1898, and years from January 1st, 1898 and 1897:

	Coin and Bullion Exp.	Imp.	In Ores Exp.	Imp.
Gold—				
Feb.	\$951,367	\$5,320,109		\$522,152
1898	3,585,656	10,951,655	\$2,458	1,598,779
1897	768,641	1,001,321	56,561	491,523
Silver—				
Feb.	3,753,331	387,034	6,720	1,656,350
1898	8,015,727	924,349	46,144	3,650,519
1897	8,655,116	1,640,069	223,061	3,443,519

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

Average Monthly Prices of Silver.

	In New York per ounce Troy, from January 1st, 1898, and for the years 1897 and 1896:	1897	1896
Month.	Cents.	Cents.	Cents.
January.....	66.77	64.79	67.13
February.....	66.07	64.67	67.67
March.....	61.90	63.04	68.40
April.....		61.85	67.92
May.....		60.42	67.78
June.....		60.10	68.69
July.....		59.61	68.75
August.....		54.19	67.34
September.....		55.24	66.68
October.....		57.87	66.05
November.....		57.91	64.93
December.....		58.01	65.21
Year.....		59.79	67.73

The Treasury Department estimate of money in the United States on April 1st, is as follows:

	In Circulation	In Treasury	Totals.
Gold coin.....	\$52,129,742	\$147,256,076	\$299,385,818
Silver dollars.....	58,562,597	400,637,825	459,200,422
Subsid. silver.....	61,613,802	11,965,278	73,579,080
Gold certificate.....	36,319,199	1,607,950	37,927,149
Silver certificate.....	287,770,898	9,859,606	297,630,504
Treas. nts. 1810.....	99,709,432	3,905,848	103,615,280
U. S. notes.....	267,305,587	79,375,429	346,681,016
Currency cert.....	37,900,180	3,380,046	41,280,226
Nas. bnk. nts.....	231,742,338	2,769,491	324,481,879
Totals.....	\$1,766,038,645	\$867,677,503	\$2,633,716,148

There was a net increase in the amount of circulation of \$29,681,987 as compared with March 1, and \$87,057,551, as compared with April 1, 1897. The circulation per capita on April 1st, 1898, is estimated at \$23.69 by the department.

The United States Treasury reports total revenues in March, \$32,958,750, and expenditures \$31,882,444. For the nine months of the fiscal year from July 1st to March 31st, the total receipts were

\$307,516,713. This included, however, \$52,098,723 on account of the Union and Kansas Pacific liens. Deducting all receipts and payments on those accounts the actual current receipts were \$245,417,990, and the payments \$297,920,902, showing a deficit of \$52,502,912 for the nine months.

POSITIONS WANTED

Advertisements of this class containing not more than five lines will be inserted for not exceeding three months in any year, free of charge, to all paid-up annual subscribers. Other than above \$1.00 per month will be charged. Advertisements not accepted for less than one month.

WANTED, by a young experienced man, position as quartz mill man, one who can keep mill running.
Address, A. E. CHARLESWORTH, LOCKFORD, CAL.

WANTED, by a young man, a position as Assayer, etc.; experienced, competent and has a good knowledge of all metallurgical operations. Good references.
Address, T. K. JOHNSON, STIMSON BLOCK, Los Angeles, Cal.

WANTED—An experienced Engineer with practical knowledge of management of dynamos and electric lights. Also wanted an Assayer with practical knowledge of silver metallurgy. Address with references.
VEROL MINING CO., Vekol, Arizona

FOR SALE!

I HAVE some good gold mining properties for sale at reasonable prices, some developed and some real good properties at Ward, Eldora, Gold Hill, Jamestown, Magnolia, Carbon and Sugar Loaf. Write stating what you want or call on me.
JAMES M. NORTH, Former County Judge, BOULDER, COLO.

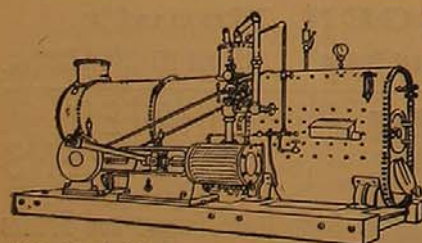


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245 S. Spring St., Los Angeles, Cal.

Engines
Boilers
Saw Mills

Write for Catalogue and Prices.

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One 36"x84" Water Jacket Furnace, Boiler, Engine Blower, Rock Breaker, Scales, Shafting, Pulleys, Belting, Tools and all fittings and fixtures complete and new, built by Frazer & Chalmers; also one 16x42 Hamilton Corliss Engine; one 12x20 double Cylinder Hoisting Engine. Will be delivered f. o. b.

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Chemist to the Board of Health of the City of Spokane. All Assays guaranteed to check with United States Mint.

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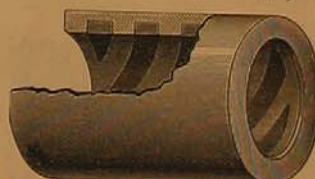
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Johannesburg, Cal.

MINING STOCK QUOTATIONS

LOS ANGELES, CAL.

Brown Dake.....	07½	Old Dominion.....	03½
East Armagona.....	01½	Pacific Con.....	03½
Gold Bug.....	03½	Sun Dance.....	25
Little Butte.....	15	Val Verde.....	10½
Magganetta.....	01½	Wedge.....	08
Mohawk Action.....	25		

SAN FRANCISCO.

Alpha.....	—	Exchequer.....	—
Alta Con.....	10	Gould & Curry.....	24
Andes.....	24	Hale & Norcross.....	1 85
Belcher.....	23	Justice.....	55
Best & Belcher.....	35	Mexican.....	39
Bodie.....	—	Ophir.....	80
Bullion.....	10	Overman.....	48
Challenge.....	28	Potosi.....	48
Confidence.....	65	Santa Nevada.....	67
Con. Cal. & Va.....	1 0	Union Con.....	30
Con New York.....	—	Utah.....	07
Crown Point.....	17	Yellow Jacket.....	03

SALT LAKE CITY

Alice.....	1 00	Little Pittsburg.....	02½
Ajax.....	40	Lucky Bill.....	10
Alliance.....	40	Malvern.....	35
Anchor.....	1 25	Mammoth.....	2 17½
Bogan.....	04	Maxfield.....	—
Buckeye.....	02½	Mercur.....	8 50
Bull, Beck.....	6 35	Morgan.....	17
Cent. Eureka.....	28 50	Northern Light.....	23½
Chloride Point.....	62	Omaha.....	—
Daly.....	00	Overland.....	4 00
Daly West.....	5 50	Richmond Ana.....	65
Dalton & Lark.....	10	conda.....	04½
Dexter.....	1 15	Rover.....	30
Eagle.....	04½	Sacramento.....	42½
East Golden Gate.....	01	Silver King.....	18 50
Eureka Hill.....	—	Sioux Con.....	1 00
Four Aces.....	07½	Sunbeam.....	03½
Galena.....	65	Swansea.....	2 22½
Gemini.....	—	Swansea.....	1 25
Geyser-Marion.....	1 07½	So. Swansea.....	58
Grand Central.....	2 00	Utah.....	1 25
Homestake.....	01	Utah Con.....	40
Horn Silver.....	1 85		

ROSSLAND, BRITISH COLUMBIA.

Alberta.....	05	Josie Mac.....	12½
B. C. Gold King.....	07	Josie.....	38
Beaver.....	10	Junio.....	10
Big Three.....	10	Knight Templar.....	05
Bluebird.....	07	Kootenay-London.....	10
Bruce.....	10	Le Roi.....	8 00
Butte.....	01½	Lilly May.....	18
Caledonia Con.....	05½	Mabel.....	15
California.....	15	Mayflower.....	10
Camp Bird.....	05	Monta.....	18
Celtic Queen.....	05	Monte Christo.....	19½
Centre Star.....	—	Morning Star.....	08
Colonna.....	24	Mugwump.....	03
Commander.....	18	Nest Egg.....	05
Deer Park.....	12½	Northern Belle.....	10
Della Colla.....	02	Novelty.....	09
Delaware.....	12	O. K.....	10
Enterprise.....	20	Palo Alto.....	05
Eric.....	03½	Phonix.....	13½
Eureka Con.....	05½	R. E. Lee.....	15
Evening Star.....	08½	Red Eagle.....	08
Georgia.....	10½	Red Mount. View.....	10
Gertrude.....	10½	Red Point.....	10
Golden Drip.....	15	Ross'd H'mest'ke.....	05
Good Hope.....	03½	Rossland, Red Mt.....	20
Grand Price.....	03½	St. Elmo.....	08
Great Western.....	08	St. Paul.....	12½
Hattie Brown.....	04	Silver Bell.....	08
Helena.....	04	Silverine.....	08
High Ore.....	04½	So. Cross & W. Con.....	20
Imperial.....	10	Virginia.....	12
Iron Horse.....	20	War Eagle Con.....	1 00
Iron Mask.....	38	West Le Roi.....	21
I. X. L.....	10	White Bear.....	11

DENVER STOCK REPORT.

Aetna.....	003½	Elkton.....	92
Alamo.....	02½	Eureka.....	009
Anaconda.....	42	Garfield Grouse.....	04
Arcadia.....	004	Golden Fleece.....	25
" Consolidated.....	01½	Goldsmith.....	008½
Argentum Junia.....	27	Gold Standard.....	02½
Bangkok-C-Bell.....	02	Insley.....	003
Bankers.....	04	Iron Clad.....	02½
Ben Hur.....	02½	Isabella.....	28½
Bob Lee.....	04½	Jack Pot.....	04½
Boston & C. C.....	01½	Jefferson.....	08½
Chimbarazo.....	002	Mollie Gibson.....	70
C. K. & N.....	008	New Zealand.....	05½
Colo. C. & M.....	01½	People's.....	01½
C. C. Con.....	08½	Pharmacist.....	08½

HELENA, MONTANA

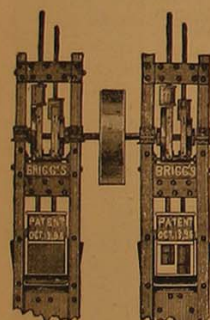
Am Den & M Co.....	1 00	Helena & Frisco.....	8 00
Bald Butte.....	2 50	Iron Mountain.....	—

Bl-Metallic.....	—	Merrill.....	—
Combination.....	—	Ontario.....	—
Con T & P'n n.....	35	Yellowstone.....	11
Diamond Hill.....	—		

MEXICO

Name of Company	State	Price
Alianza.....	Hidalgo.....	5
Amistad y Concordia.....	".....	24
Angustias.....	Guanajuato.....	710
Arevalo y Anexas.....	Hidalgo.....	200
Asturiana y Anexas.....	Zacatecas.....	210
Barradon y Cabras.....	Durango.....	300
Barloome de Medina.....	Hidalgo.....	180
Cabezon y An.....	Zacatecas.....	30
Candelaria de Pinos.....	".....	180
Candelaria de Panuco.....	".....	20
Candelaria de Chalch.....	".....	120
Capuzaya.....	Durango.....	350
Carmen.....	Tepic.....	80
Castellana y San Ram.....	Chihuahua.....	10
Cerro Colorado.....	Guanajuato.....	850
Cinco Senores y An.....	S. Luis Potosi.....	280
Concepcion y Anexas.....	Guanajuato.....	40
El Oro.....	Mexico.....	1,300
Esparanza y An.....	Guanajuato.....	180
Guadalupe.....	Santa Ana.....	100
Huautla.....	Michoacan.....	200
Luz de Borda.....	Hidalgo.....	150
Luz de Maravillas.....	Zacatecas.....	150
Pabellon.....	".....	5
Palma.....	Hidalgo.....	900
Purissima de los Com.....	".....	8
Real del Monte.....	Durango.....	60
Refugio y Va.....	".....	50
Restauradora.....	Hidalgo.....	270
Rosario y Anexas.....	".....	100
San Francisco.....	".....	925
S. Ped. Chalchihuites.....	".....	400
San Rafael y Anexas.....	Hidalgo.....	0
do. Free Stock.....	S. Luis Potosi.....	790
San Rafael del Oro.....	Durango.....	30
Ste. Maria de la Paz.....	Hidalgo.....	490
Sirena.....	".....	200
Soledad.....	Guanajuato.....	50
Sorpresas.....	Puebla.....	47
Trinidad.....	Hidalgo.....	220
Union.....	".....	65
Uauzingo.....	Vera Cruz.....	1010
Zaragoza.....	Guanajuato.....	15
Zamelahuacan (gold).....		
Zona Min de Pozos.....		

Note.—The above Mexican stocks are figured on the basis of Mexican silver



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Successor to San Francisco Tool Co.'s Machine & Mfg Dept.

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Briggs' 2-Stamp Triple-Discharge Quartz Mill, of latest improved pattern, Rock Breakers, Ore Feeders, Concentrators, Engines and Boilers, Hoisting Rigs to be operated by Horse, Steam Power or any other motor; Ore Cars and Ore Buckets, Cornish and Jack-head Pumps, Triple-Acting Pumps, Centrifugal Sand and Gravel Pumps, Wooden Tanks and Pumps for the Cyanide Process, Pipe and Gate Valves, Link Chain Elevators for elevating and conveying all kinds of material. Estimates as to cost of machinery and its erection furnished upon application. Write for Catalogue and Prices.

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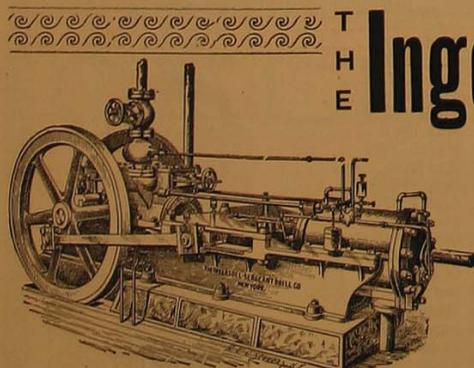
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NAMES OF MINES	LOCATION	No. of Shares	Capital Stock	Par Value	Amount of last Dividend	Date of Last Dividend	Total Amount Paid in Dividends	Kind of Mineral Produced
Aetna Cons.	California	100,000	\$ 500,000	\$ 5	\$ 10	Sept 1897	\$ 110,000	Q.
Adams	Colorado	150,000	1,500,000	10	04	October 1895	693,500	S, L, C.
Alaska, Treadwell	Alaska	200,000	5,000,000	25	35 1/2	October, 1897	3,250,000	G.
Alaska Mexican	Alaska	200,000	1,000,000	5	10	Oct., 1897	297,031	G.
Alice	Montana	400,000	10,000,000	25	03	Oct 1897	1,055,000	G.
Anaconda	Montana	1,200,000	30,000,000	25	1 25	May 1897	3,750,000	C.
Anchoria Leland	Colorado	600,000	600,000	1	01	Oct 1897	84,000	G.
American Gold	Colorado	300,000	3,000,000	10	02	Aug 1897	273,000	G. S. L.
Atlantic	Michigan	40,000	1,000,000	25	1 00	Feb. 1897	740,000	S.
Bald Butte	Montana	250,000	250,000	1	03	Sept 1897	512,500	G, C. S.
Bangkok C-Bell	Colorado	600,000	600,000	1	01	July 1896	107,510	S. L. C.
Big Six	Colorado	500,000	500,000	1	00 1/2	April 1897	5,000	G. S.
Boston & Montana	Montana	150,000	3,750,000	25	3 00	Aug 1897	6,275,000	G, C. S.
Bullion Beck and Champion	Utah	100,000	1,000,000	10	50	Mar 1897	2,465,000	G, S.
Bunker Hill and S	Idaho	300,000	3,000,000	10	05	Oct 1897	324,000	S. L.
Cariboo	British Col.	800,000	800,000	1	02	May 1897	156,965	G.
C. O. D.	Colorado	50,000	500,000	1	01	March 1896	25,000	G.
Calumet & Hecla	Michigan	10,000	2,500,000	25	10 00	Oct. 1897	50,850,000	C.
Centennial Eureka	Utah	30,000	1,500,000	50	1 00	Mar 1897	2,010,000	S. L.
Central Lead	Missouri	4,000	400,000	100	1 00	Oct 1897	16,000	L.
Charleston	South Car	10,000	1,000,000	100	1 00	Feb 1897	150,000	.....
Champion	California	34,000	340,000	10	25	Aug 1897	278,200	G.
Consolidated, California and Virginia	Nevada	216,000	21,600,000	100	25	March 1895	3,592,800	G. S.
Copper Queen Consolidated	Arizona	200,000	2,000,000	10	25	June 1895	1,910,000	C.
Crescent	Utah	24,000	600,000	25	.....	July 1897	280,000	.....
Daly	Utah	150,000	3,000,000	20	25	Mar 1897	2,925,000	S, L.
Deadwood Terra	Dakota	200,000	5,000,000	25	40	June 1897	1,320,000	G.
De Lamar	Idaho	400,000	2,000,000	5	25	Jan 1897	2,250,100	S, L.
Della S.	Colorado	1,000,000	1,000,000	1	10	Jan 1897	60,000	G.
Doe Run	Missouri	5,000	500,000	100	50	October 1897	.....	L.
Dalton and Lark	Utah	2,500,000	2,500,000	1	00 1/2	August 1896	87,500	S, L.
Elkton Consolidated	Colorado	1,250,000	1,250,000	1	03	Sept 1897	361,960	G, S.
El Paso	Colorado	650,000	650,000	1	01	Aug 1897	5,393	G. S.
Florence	Montana	500,000	2,500,000	5	01	May 1897	132,530	S.
Galena	Utah	100,000	1,000,000	10	05	Jan. 1897	71,000	G, S, L
Garfield Grouse	Colorado	1,200,000	1,200,000	1	01	Feb. 1897	24,000	G.
Geyser-Marion	Utah	300,000	1,500,000	5	03	Nov 1897	54,000	G.
Golden Eagle	Colorado	1,000,000	1,000,000	1	01	Sep. 1896	10,000	G.
Golden Fleece	Colorado	600,000	600,000	1	01	Feb. 1897	569,179	G, S.
Gold Coin	Colorado	200,000	1,000,000	5	05	Aug 1897	150,000	G. S.
Gold and Globe	Colorado	750,000	750,000	1	3-10	July 1897	61,625	G.
Hecla Consolidated	Montana	30,000	1,500,000	50	50	Feb 1897	2,175,000	S, G, L, C.
Helena & Frisco	Idaho	500,000	2,500,000	5	04	August 1896	475,000	S, L.
Highland	S. Dakota	100,000	10,000,000	100	20	Oct 1897	3,424,918	G.
Holy Terror	S Dakota	300,000	300,000	1	03	Sept 1897	18,000	G.
Homestake	Dakota	125,000	12,500,000	100	25	Oct 1897	6,431,250	G.
Hope	Montana	100,000	1,000,000	10	10	Nov 1897	732,252	S.
Horn Silver	Utah	400,000	10,000,000	25	12 1/2	January 1896	5,080,000	S, L.
Idaho	Brit. Col.	500,000	500,000	1	05	Mar 1887	152,000	.....
Iowa	Colorado	1,000,000	1,000,000	1	00 1/2	Oct 1897	65,000	G.
Iron Mountain	Montana	500,000	5,000,000	10	01	Sept 1897	497,500	S.
Isabella	Colorado	2,250,000	225,000	100	00 1/2	June 1897	270,000	G.
Kearsarge	Michigan	40,000	1,000,000	25	10	Aug 1897	160,000	C.
Last Chance	Brit. Col.	500,000	500,000	1	04	Jan 1897	42,000	S. L.
Le Roi	British Col	500,000	2,500,000	5	10	Oct 1897	625,000	G.
Minnesota	Minnesota	185,000	16,500,000	100	1 50	July 1896	3,240,000	I.
Montana Ore Purchasing	Montana	40,000	1,000,000	25	01	October 1897	640,000	.....
Moose	Colorado	600,000	600,000	1	01	January 1896	186,000	G.
Morning Star	California	2,400	240,000	100	8 00 1/2	Sept. 1897	558,800	G.
Mt. Rosa	Colorado	1,000,000	1,000,000	1	00 1/2	Oct. 1896	30,000	G.
Mercur	Utah	200,000	5,000,000	25	12	Oct 1897	825,000	G.
Mammoth	Utah	400,000	10,000,000	25	05 1/2	Nov. 1896	1,150,000	G, S, O.
Moon Anchor Gold	Colorado	600,000	600,000	1	02	Nov 1897	63,000	G.
New Elkhorn	Colorado	300,000	1,500,000	5	24	Sep. 1896	72,000	G
New York & Hon. Rosario	Central A.	150,000	1,500,000	10	10	Oct. 1897	832,500	S, G.
Napa	California	100,000	700,000	7	20	Oct 1897	870,000	Q.
New Idria Quicksilver	California	100,000	500,000	5	10	Sept 1897	20,000	Q.
Ontario	Utah	150,000	15,000,000	100	10	June 1897	13,445,000	S, L.
Osceola	Michigan	50,000	1,250,000	25	1 00	June 1897	2,172,500	C.
Parrot	Montana	230,000	2,300,000	10	08	June 1897	1,656,122	C.
Pennsylvania Consolidated	California	51,500	5,150,000	10	05	Sept 1897	20,750	.....
Portland	Colorado	3,000,000	3,000,000	1	01 1/2	Oct 1897	1,163,000	G, S.
Princess	Colorado	1,000,000	1,000,000	1	00	Feb 1897	45,000	G.
Quincy	Idaho	100,000	2,500,000	25	4 00	August 1897	9,470,000	C.
Rambler-Cariboo	Brit. Col	1,000,000	1,000,000	1	02	April 1897	40,000	.....
Reco	Brit. Col	1,000,000	1,000,000	1	50 1/2	May 1897	187,500	S, L.
Sacramento	Utah	1,000,000	5,000,000	5	00	March 1897	22,000	G.
Small Hopes Consolidated	Colorado	250,000	5,000,000	20	10	Mar 1896	3,275,000	S.
South Swansea	Utah	150,000	150,000	1	05	Oct 1897	59,960	S, L.
Standard	California	200,000	20,000,000	100	10	Sept 1897	3,757,868	G, S.
St. Joseph	Missouri	250,000	2,500,000	10	15	Oct 1897	24,000	L.
Silver King	Utah	150,000	3,000,000	20	25	October 1897	1,237,500	S, L, G.
Slocan Star	Brit. Col.	2,000,000	1,000,000	0.50	05	Mar 1897	350,000	.....
Smuggler Union	Colorado	50,000	5,000,000	100	1 00	Oct 1896	150,000	G. S.
Swansea	Utah	100,000	500,000	5	05	Oct 1897	61,500	S. L.
Tom Boy	Colorado	200,000	2,000,000	10	20	March 1896	410,000	G.
Tamarack	Michigan	60,000	1,500,000	15	3 00	June 1897	4,950,000	C.
Union	Colorado	1,250,000	1,250,000	1	01	June 1896	73,000	S.
United Verde	Arizona	300,000	3,000,000	10	25	December 1893	562,500	C.
Utah	Utah	100,000	1,000,000	20	02	Feb. 1897	175,000	G, S.
Utah Consolidated	Utah	30,000	150,000	5	02	Sept. 1896	3,000	S. L.
Victor	Colorado	200,000	1,000,000	5	10	March 1897	765,000	G.
Western Mine Enterprise	Montana	500,000	500,000	1	10	Mar 1897	12,000	.....
War Eagle	British Col.	500,000	500,000	1	08	October 1896	187,000

S, Silver

G, Gold.

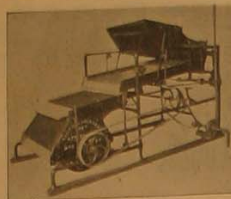
L, Lead.

C, Copper.

Q, Quicksilver.

I, Iron.

B, Borax.

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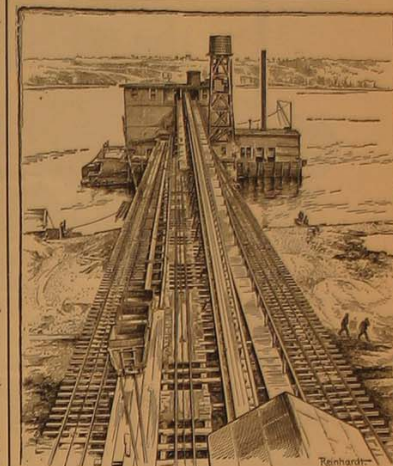
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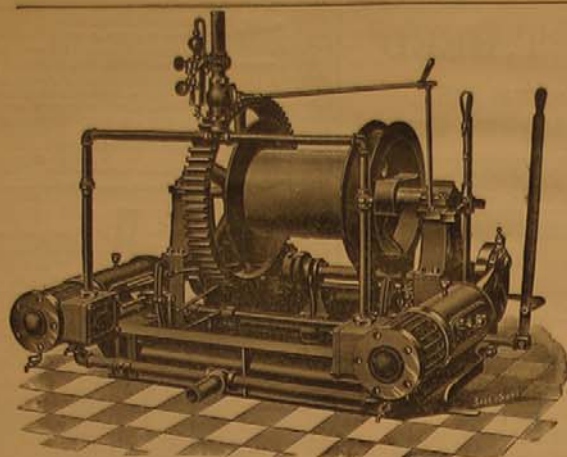
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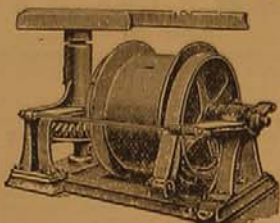
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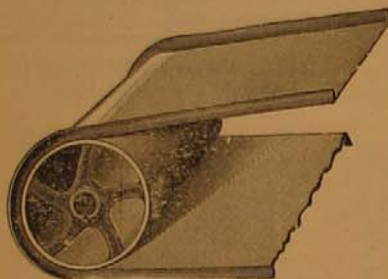
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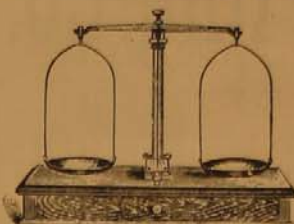
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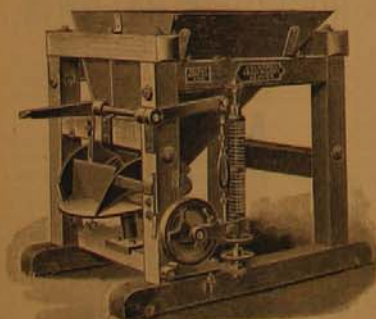
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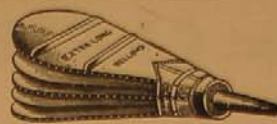
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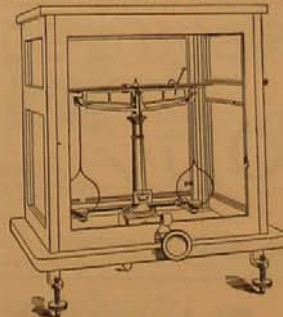
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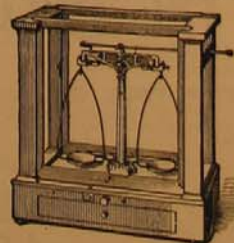
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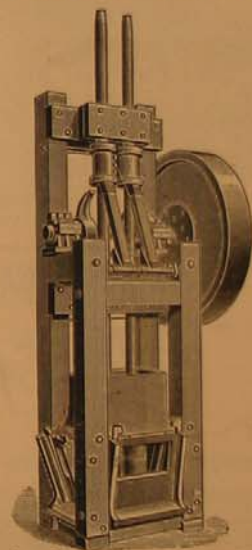
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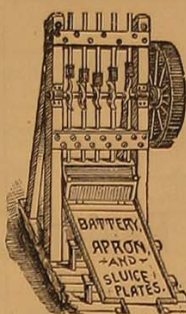
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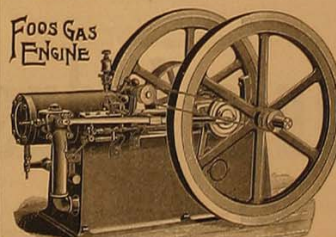
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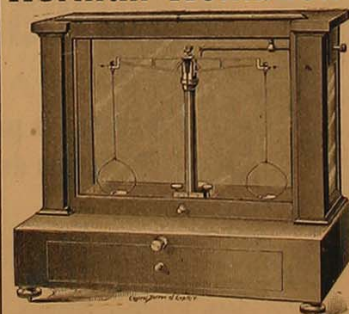
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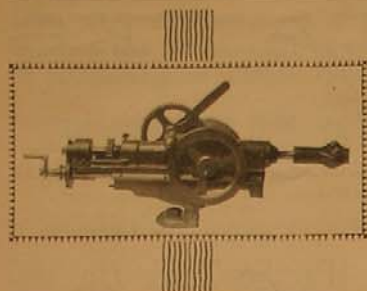
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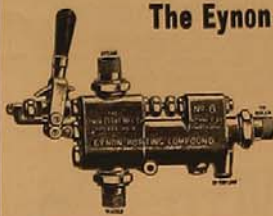
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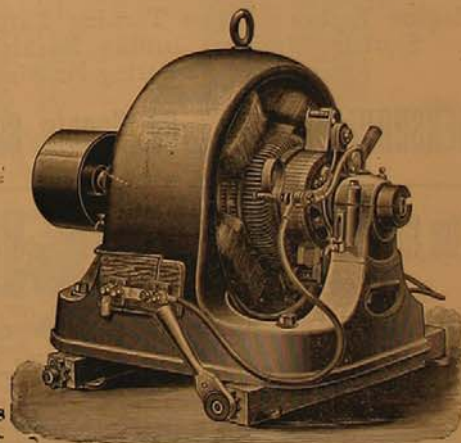
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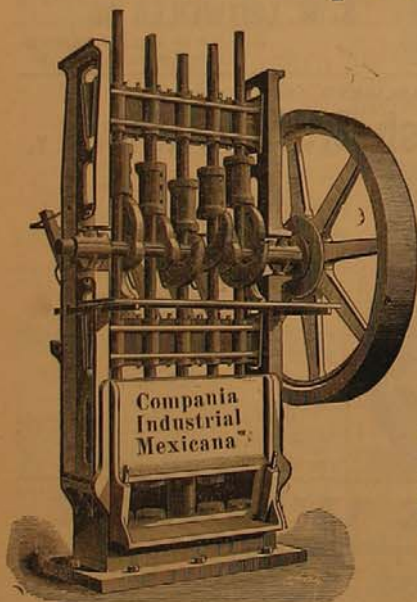
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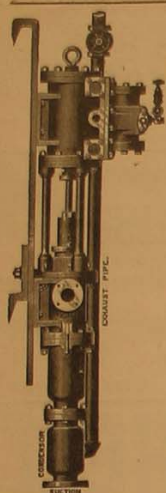
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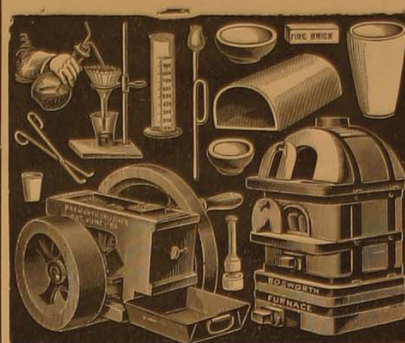
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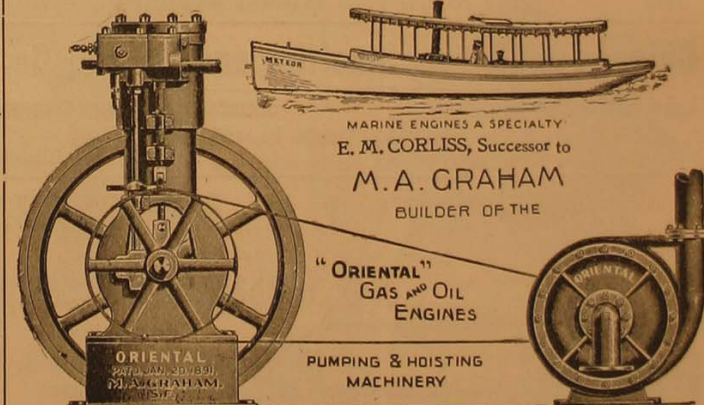
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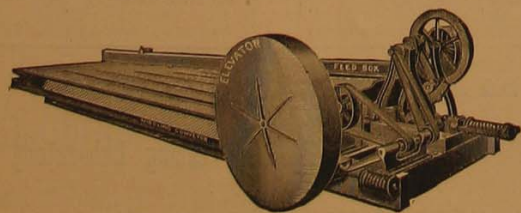
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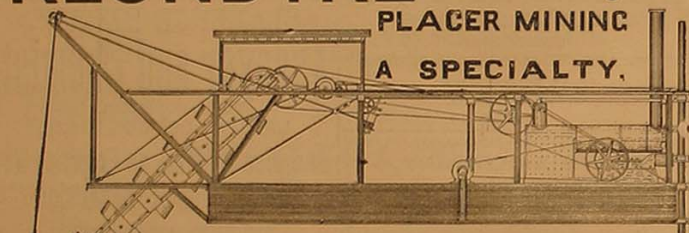
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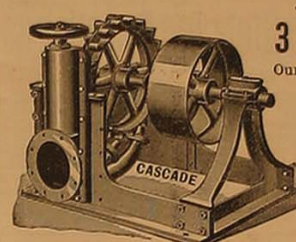
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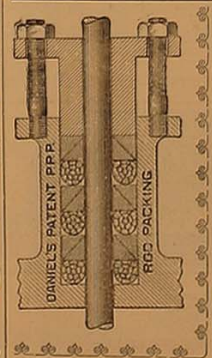
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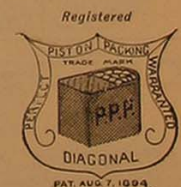
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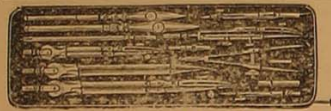
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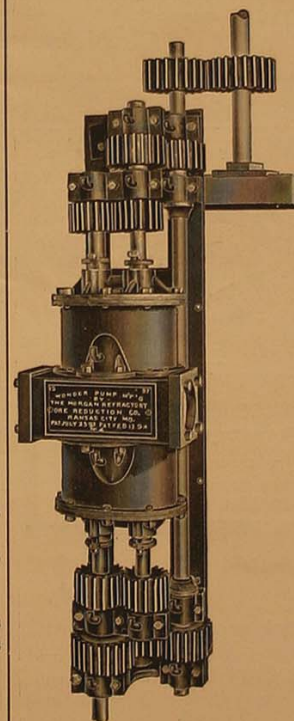
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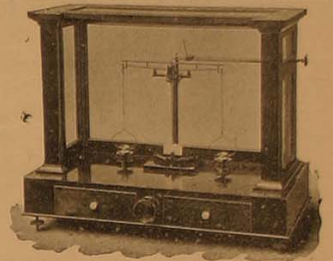


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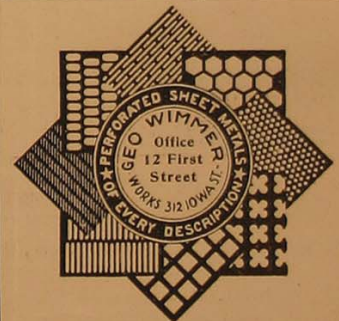
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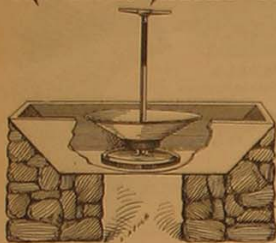
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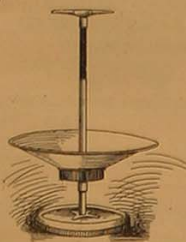
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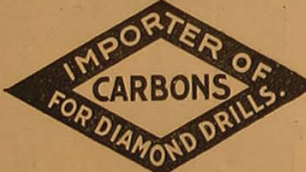
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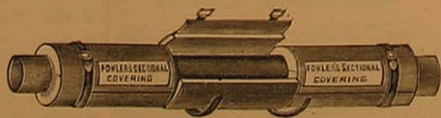
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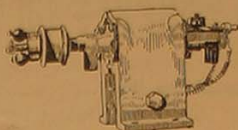
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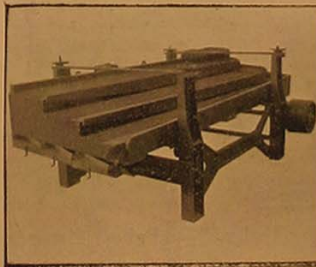
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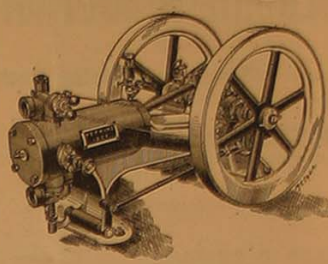
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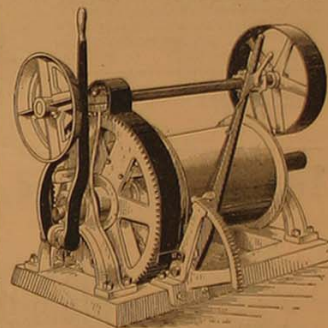
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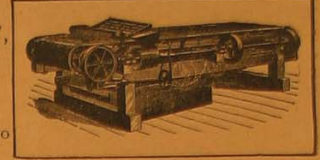
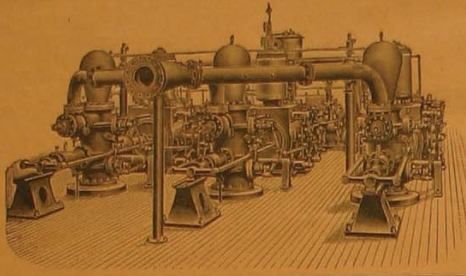
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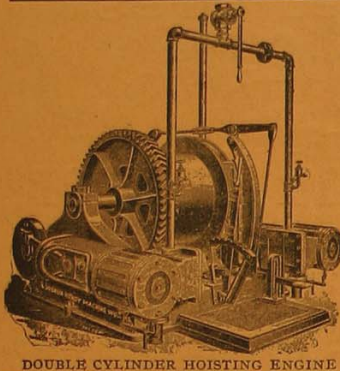
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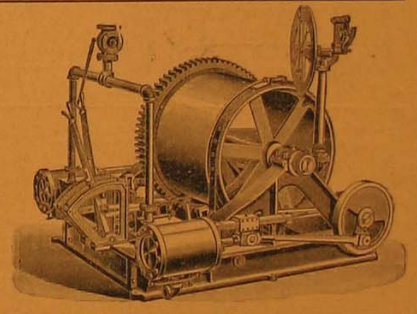
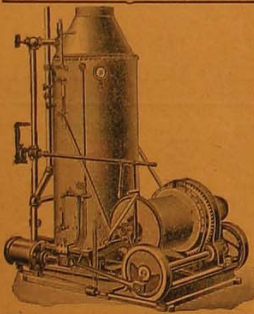
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